

Historic, Archive Document

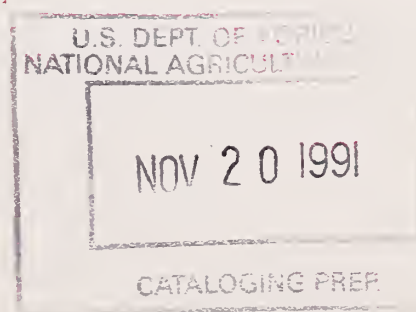
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The Consumer's Choice

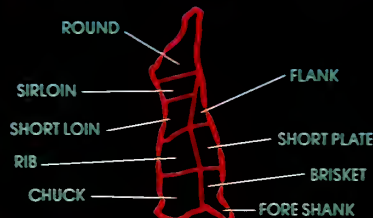
Meat Education Program



United States
Department of
Agriculture

Beef

• RETAIL CUTS • WHERE THEY COME FROM HOW TO COOK THEM



Round Steak
Braise, Panfry



Top Round Roast
Roast



Top Round Steak
Broil, Panbroil, Panfry



Boneless Rump Roast
Roast, Braise



Bottom Round Roast
Braise, Roast



Tip Roast, Cap Off
Roast, Braise



Eye Round Roast
Braise, Roast



Tip Steak
Broil, Panbroil, Panfry



ROUND

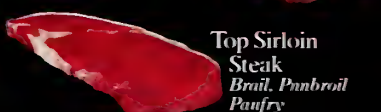
Sirloin Steak, Flat Bone
Broil, Panbroil, Panfry



Sirloin Steak, Round Bone
Broil, Panbroil, Panfry



Top Sirloin Steak
Broil, Panbroil, Panfry



SIRLOIN



Shank Cross Cut
Braise, Cook in Liquid



Brisket, Whole
Braise, Cook in Liquid

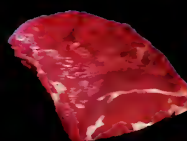


Corned Brisket, Point Half
Braise, Cook in Liquid



Brisket, Flat Half
Braise

FORE SHANK & BRISKET



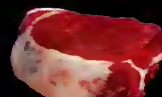
Chuck Eye Roast
Braise, Roast



Boneless Top Blade Steak
Braise, Panfry



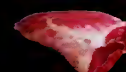
Arm Pot Roast
Braise



Boneless Shoulder Pot Roast
Braise



Cross Rib Pot Roast
Braise



Mock Tender
Braise



Blade Roast
Braise



Under Blade Pot Roast
Braise, Roast



7-Bone Pot Roast
Braise



Short Ribs
Braise, Cook in Liquid

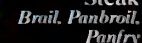


Flanken-Style Ribs
Braise, Cook in Liquid

CHUCK



T-Bone Steak
Broil, Panbroil, Panfry



Boneless Top Loin Steak
Broil, Panbroil, Panfry



Tenderloin Roast
Roast, Broil



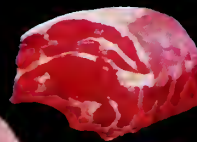
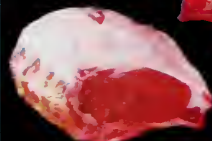
Porterhouse Steak
Broil, Panbroil, Panfry



Tenderloin Steak
Broil, Panbroil, Panfry

SHORT LOIN

Rib Roast, Large End
Roast



Rib Steak, Small End
Broil, Panbroil, Panfry

Rib Roast, Small End
Roast



Rib Eye Roast
Roast



Rib Eye Steak
Broil, Panbroil, Panfry



Back Ribs
Braise, Cook in Liquid, Roast

RIB



Flank Steak
Broil, Braise, Panfry



Flank Steak Rolls
Braise, Broil, Panbroil, Panfry

Skirt Steak
Braise, Broil, Panbroil, Panfry



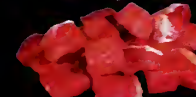
FLANK & SHORT PLATE



Ground Beef
Broil, Panfry, Panbroil, Roast (Bake)



Cubed Steak
Panfry, Braise



Beef for Stew
Braise, Cook in Liquid



Cubes for Kabobs
Broil, Braise

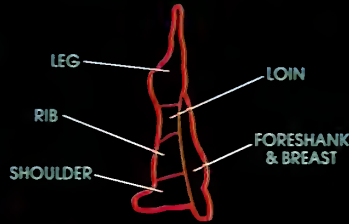
OTHER CUTS

THIS CHART APPROVED BY
NATIONAL LIVE STOCK & MEAT BOARD



Lamb

• RETAIL CUTS •
WHERE THEY COME FROM
HOW TO COOK THEM



Whole Leg
Roast



Short
Cut Leg,
Sirloin Off
Roast



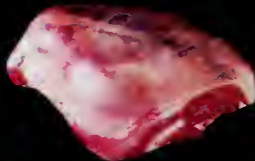
Shank
Portion Roast
Roast



Center Leg
Roast
Roast



Center Slice
Broil, Panbroil, Panfry



American-
Style Roast
Roast



Frenched-
Style Roast
Roast



Boneless
Leg Roast
Roast,
Broil if butterflyed



Hind Shank
Braise, Cook in Liquid



Sirloin Chop
Broil, Panbroil,
Panfry, Braise



Boneless
Sirloin
Roast
Roast

LEG



Loin Roast
Roast



Loin Chop
Broil,
Panbroil,
Panfry



Double Loin Chop
Broil, Panbroil, Panfry

LOIN



Shank
Braise,
Cook in Liquid



Spareribs
Braise, Broil,
Roast



Boneless
Rolled Breast
Roast, Braise



Riblets
Braise, Cook in Liquid,
Broil

FORESHANK & BREAST



Rib Roast
Roast



Rib Chop
Broil, Panbroil,
Panfry, Roast



Frenched Rib Chop
Broil, Panbroil, Panfry



Crown
Roast
Roast



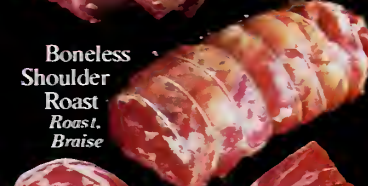
RIB



Square-Cut
Shoulder,
Whole
Roast,
Braise



Pre-Sliced
Shoulder
Roast, Braise



Boneless
Shoulder
Roast,
Braise



Neck Slice
Braise, Cook in Liquid



Blade Chop
Braise, Broil,
Panbroil, Panfry

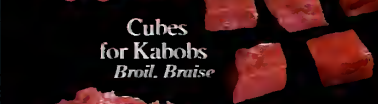


Arm Chop
Braise, Broil,
Panbroil, Panfry

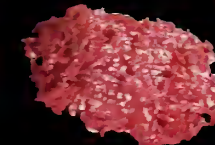
SHOULDER



Lamb for Stew
Braise, Cook
in Liquid



Cubes
for Kabobs
Broil, Braise



Ground
Lamb
Broil,
Panbroil,
Roast (Bake)

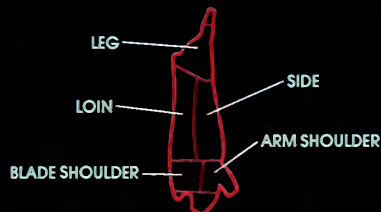
OTHER CUTS

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Pork

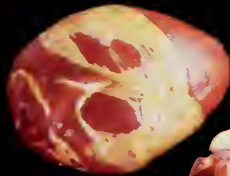
• RETAIL CUTS • WHERE THEY COME FROM HOW TO COOK THEM



Leg Cutlet
Panfry, Braise,
Broil, Panbroil



**Top Leg
(Inside) Roast**
Roast, Braise



Smoked Ham
Roast



**Smoked Ham
Shank Portion**
Roast



**Smoked Ham
Center Slice**
Broil, Panbroil,
Panfry, Roast



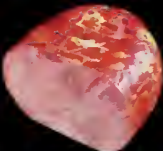
**Smoked Ham
Rump Portion**
Roast



Canned Ham
Roast



Sliced Ham
Panfry, Panbroil,
Braise



**Boneless
Smoked Ham**
Roast

LEG/HAM



Blade Roast
Roast, Braise



Blade Steak
Braise, Broil,
Panbroil, Panfry

Boneless Blade Roast
Roast, Braise

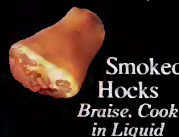


**Smoked
Shoulder Roll**
Roast, Cook in Liquid

**Boneless Arm
Picnic Roast**
Roast, Braise

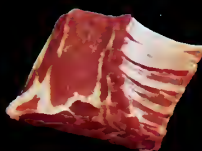


**Smoked
Picnic**
Roast, Cook
in Liquid



**Smoked
Hocks**
Braise, Cook
in Liquid

SHOULDER



Country-Style Ribs
Roast, Braise, Broil,
Cook in Liquid



**Center Rib
Roast**
Roast



Sirloin Roast
Roast



**Boneless Sirloin
Roast**
Roast



Sirloin Cutlet
Braise, Broil, Panbroil,
Panfry



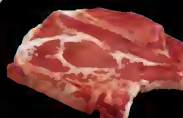
Blade Roast
Roast, Braise



Crown Roast
Roast

**Smoked
Loin Chop**
Roast, Broil,
Panbroil, Panfry

LOIN



Blade Chop
Braise, Broil, Panbroil,
Panfry



Rib Chop
Broil, Panbroil,
Panfry, Braise



Top Loin Chop
Broil, Panbroil, Panfry,
Braise



Loin Chop
Broil, Panbroil,
Panfry, Braise



Sirloin Chop
Braise



Butterfly Chop
Broil, Panbroil,
Panfry, Braise

Back Ribs

Roast, Broil,
Braise, Cook
in Liquid

Tenderloin
Roast, Braise,
(Slices: Panfry,
Braise)

**Top Loin Roast
(Double)**
Roast

**Boneless
Blade Roast**
Roast, Braise

**Center
Loin Roast**
Roast

Canadian-Style Bacon
Roast, Broil, Panbroil, Panfry



Spareribs
Roast, Broil, Cook in Liquid,
Braise



**Sliced
Bacon**
Panfry, Broil,
Roast (Bake)

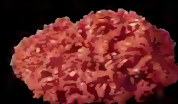
SIDE

Cubed Steak
Braise, Panbroil, Panfry

Pork Pieces
Braise, Cook in Liquid



**Cubes for
Kabobs**
Broil, Braise



Ground Pork
Broil, Braise,
Panfry, Roast (Bake)



Sausage Links
Braise, Panfry, Roast

OTHER CUTS

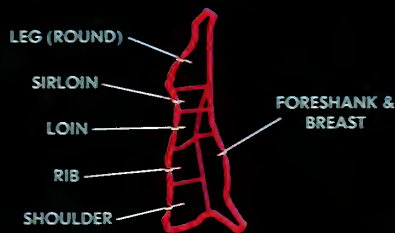
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Veal

• RETAIL CUTS • WHERE THEY COME FROM HOW TO COOK THEM

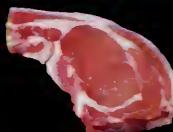


Rib Roast
Roast

Boneless Rib Roast
Roast



Crown Roast
Roast



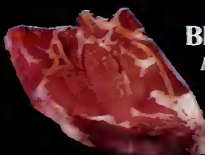
Boneless Rib Chop
Braise, Panfry, Broil

Rib Chop
Braise, Panfry, Broil



Short Ribs
Braise, Cook in Liquid

RIB



Blade Roast
Braise, Roast

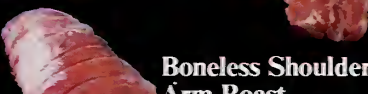
Arm Roast
Braise, Roast



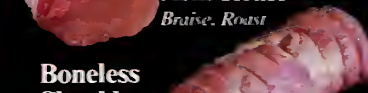
Blade Steak
Braise, Panfry



Arm Steak
Braise, Panfry



Boneless Shoulder Arm Roast
Braise, Roast



Boneless Shoulder Eye Roast
Braise, Roast

SHOULDER



Boneless Rump Roast
Braise, Roast

Round Steak
Braise, Panfry



Top Round Steak
Braise, Panfry



Leg Cutlet
Braise, Panfry, Broil

LEG (ROUND)



Breast
Braise, Roast



Boneless Breast Roast
Braise, Roast



Cross Cut Shank
Braise, Cook in Liquid

Riblet
Braise, Cook in Liquid



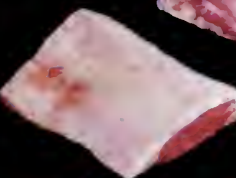
Shank
Braise, Cook in Liquid

FORESHANK & BREAST

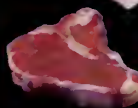
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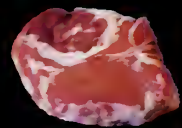
Loin Roast
Roast



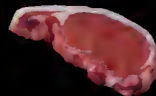
Boneless Loin Roast
Roast



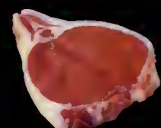
Loin Chop
Braise, Panfry, Broil



Kidney Chop
Braise, Panfry



Top Loin Chop
Braise, Panfry, Broil



Butterfly Chop
Braise, Panfry, Broil

LOIN

Sirloin Roast
Roast



Boneless Sirloin Roast
Roast

Sirloin Steak
Braise, Panfry, Broil



Top Sirloin Steak
Braise, Panfry, Broil

SIRLOIN



Veal for Stew
Braise, Cook in Liquid

Ground Veal
Panfry, Broil



Cubes for Kabobs
Braise

Cubed Steak
Braise, Panfry



OTHER CUTS





The Consumer's Choice

Introduction





The Consumer's Choice

*The Livestock Industry:
Production Of Lean,
Wholesome Meat
For The Consumer*



The Consumer's Choice

*Meat, Nutrition
And Your Health*



The Consumer's Choice

*Making Sense
Of Meat Purchases*



The Consumer's Choice

*Preparation Of Today's
Lean Meat*



The Consumer's Choice

*Meat, A Convenience
Bill Of Fare*



The Consumer's Choice

Appendix

INTRODUCTION

	Page
Introduction to Lean Meat Modules	Introduction
A. Overview	2
B. Target Audiences	3
C. Developing State and County Marketing Strategies	4
D. Instructor/Extension Agent Program Evaluation	9
E. Credits	11
MODULE I: The Livestock Industry: Production of Lean, Wholesome Meat for the Consumer	Industry
A. MODULE I. Introduction	1
B. Unit 1. Move Toward Leanness in the Livestock Industry	2
C. Unit 2. Meat Safety and Wholesomeness	16
MODULE II: Meat, Nutrition and Your Health	Nutrition
A. MODULE II. Introduction	1
B. Unit 1. Meat Nutrition—Overview	3
C. Unit 2. Meat Nutrition—Fats and Cholesterol in the Diet	25
D. Unit 3. Meat Nutrition—Sodium in the Diet	57
MODULE III: Making Sen\$e of Meat Purchases	Selection
A. MODULE III. Introduction	1
B. Unit 1. Meat Cut Identification and Evaluation	3
C. Unit 2. Shopping for Lean Meat	34
MODULE IV: Preparation of Today's Lean Meat	Preparation
A. MODULE IV. Introduction	1
B. Unit 1. Meat Cookery	2
C. Unit 2. Proper Handling and Storage of Meat	19
MODULE V: Meat: A Convenience Bill of Fare	Convenience
A. MODULE V. Introduction	1
B. Unit 1. A New Generation of Convenience Entrees and Dinners	4
C. Unit 2. Shopping a la Carte—Take-Out Meats	15
D. Unit 3. Eating Out: Your Guide to Good Eating	26
Appendix	Appendix
A. List of Camera-Ready Copies of Handouts	1
B. Address List for Supplementary Materials	3
C. Supplementary Resource Materials	9
D. References	17
E. Publicity Materials	26

Introduction to Lean Meat Modules

A. Overview

According to the *Dietary Guidelines for Americans*, the average person needs 40 different nutrients to assure good health. Most foods contain more than one nutrient, but no one food supplies all the essential nutrients needed. Therefore, to consume an adequate diet, one must eat a variety of foods in moderation. Recent consumer surveys have shown significant trends in concerns and selection of foods, especially from the meat, poultry, fish, eggs and dry beans and peas food group. Within that group, concerns have primarily focused on meat. The origin of these concerns is complex, but revolves primarily around the effects of fat and cholesterol in the diet and the relative amounts of these components contributed by meat. In recent years the livestock and meat industries have changed feeding and management practices to produce leaner cattle, sheep and hogs. Also retailers have dramatically reduced the amount of external fat on meat cuts. New nutrient profile data on meat released in USDA Handbook 8 reflect these trends. At the same time, changes have occurred in our understanding of fat and cholesterol and the role they play in diet and disease.

To help educate the public concerning these dynamic changes, USDA initiated the Meat Education Project to provide consumers with the knowledge and skills needed to incorporate lean meat into a well-balanced, varied diet. Titled "*The Consumer's Choice—Lean Meat*," the program was developed by a multi-state, multi-disciplinary team of meat science and food and nutrition specialists from Florida, Kansas and Texas. An advisory group consisting of representatives from commodity groups and professional organizations assisted with the project.

The program incorporates research-based information currently available on lean meats. The materials were written to accommodate individuals in various age and economic groups and with varying knowledge levels concerning meats. This extensive meats program is divided into five modules:

- Module I:** "The Livestock Industry: Production of Lean, Wholesome Meat for the Consumer," includes information on changes in livestock production during the past 30 years and addresses consumer concerns related to meat safety and wholesomeness.
- Module II:** "Meat, Nutrition and Your Health," reviews health and nutrition information on meats (particularly as related to fats, cholesterol and sodium in the diet) and shows how meat fits within a variety of meal patterns for different lifestyles.
- Module III:** "Making Sen\$e of Meat Purchases," focuses on proper selection of meat at the retail level with emphasis on the selection of lean cuts and making wise economic meat choices.
- Module IV:** "Preparation of Today's Lean Meat," discusses preparation techniques to ensure quality and safety of meats including low fat preparation techniques for lean cuts.
- Module V:** "Meat: A Convenience Bill of Fare," focuses on the vast array of meat "convenience" products in the marketplace and includes tips on wise selection of meat products when dining out.

Each module contains an overview of the current situation regarding the topic(s) for the module, possible target audiences for that particular module, plus lists of supplementary

resources and references used in developing the materials. Samples of publicity materials (radio and newspaper press releases, public service announcements, feature articles and logo slicks) are included. Each module is divided into two or more units and each unit contains the following:

- a. Objectives of the unit
- b. Key concepts to be discussed
- c. Background information for the leader/instructor
- d. Advance preparation guide
- e. Teaching outline/lesson plan
- f. Suggested learning activities
- g. Camera ready handout/worksheet samples and fact sheets
- h. Evaluation instruments

Each unit is designed to be flexible enough to be taught alone, in a series of classes or activities focusing on the topics found within the particular module, or in a series encompassing two or more of the modules. The materials should be adapted to meet the needs of specific audiences and situations.

In addition to the five modules, an extensive listing of supplementary materials and addresses for obtaining these materials is included. Several samples of materials have also been provided by various meat commodity and/or health organizations for inclusion in the notebook.

Marketing strategies have been developed to assist individual states and counties in maximizing the use of these materials. In addition, a marketing plan was developed for the promotion and implementation of the meat education materials on a national basis.

Educators play a key role in providing the most current research-based information to the public on the meat products of today. Hopefully, this educational program, *"The Consumer's Choice—Lean Meat,"* will help strengthen the link between nutrition/health professionals and the meat industry.

B. Target Audiences

"The Consumer's Choice—Lean Meat" is appropriate for a variety of audiences. Consider your audience both individually and as a group. Are you teaching in a formal or an informal situation? How much experience have they had in food shopping, storage, preparation and creative meal planning? Will there be ethnic, income and/or ability levels to consider? To what extent are dietary problems a consideration? How do eating habits and mode of living affect meal patterns and nutritional aspects—the right choice for one may be entirely wrong for another. To what extent is time a factor?

If the materials are to be used with mass media, consider using some of the publicity materials included within the modules, but also contact the newspaper/magazine food editor or appropriate broadcast journalist to determine story angles for the targeted audience of the particular publication or station.

Suggestions for specific target audiences and possible activities for those audiences for each module are listed immediately following the situation statement for the module. Use this list as an idea generator for appropriate target audiences for your particular location and situation.

C. Developing State and County Marketing Strategies

STRATEGY 1. Secure co-sponsors (or cooperators) for programs, seminars, short courses, workshops, in-service training sessions, tours, special events, in-store activities, etc. These co-sponsors may cooperate in a variety of ways including:

- a. Providing a ready-made audience
- b. Providing a meeting location
- c. Advertising your program to their clients/membership in newsletters, news releases, or paid advertising
- d. Donating meat products for use in presentation
- e. Assisting in securing radio/television time for promoting your program/activity
- f. Providing grant dollars for materials, travel, supplies, room rentals, etc.
- g. Providing in-store coupons or door prizes for the event

Possible co-sponsors (cooperators) include:

1. State Commodity/Agricultural Organizations

- Beef Industry Council
- Pork Producers Council
- Sheep and Goat Raisers Association or Lamb Council
- Farm Bureau
- Agricultural Cooperative Council
- National Association of County Agricultural Agents (Home Economics)
- National Extension Homemakers Council
- Cattlefeeders Association
- Breed associations (beef, pork and lamb)

2. State Agencies

- Department of Agriculture
- Department on Aging
- Department of Health
- Health and Human Services Coordinating Council
- Department on Physical Fitness

3. Special Interest Groups at the State, City or Local Level

- American Heart Association
- American Cancer Society
- Medical Associations
- Dietetic Association
- Home Economics Association
- Home Economists in Business
- Retail Grocers Association
- Meat Packers/Processor/Purveyor Association
- Restaurant Associations
- Association of Community Health Centers
- Health Care Association
- Hospital Association
- Association of Life Insurance Officials
- Hospital Education and Research Foundation
- Medical Foundation
- Nurses Association
- Society of Hospital Food Service Directors
- Veterinary Medical Association
- Wellness Coalitions

4. Business/Industry

- Retail grocery stores/supermarkets
- Meat packing/processing companies
- Meat purveyors/brokers/distributors
- Medical clinics
- Hospitals
- Nutritionists
- Physicians (Cardiovascular, Bariatrics-Weight Control, General Preventative Medicine, Family Practice, Pediatrics, Geriatrics)
- Weight control clinics
- Life insurance agencies

5. Service Clubs

- Kiwanis
- Lions
- Optimists
- Rotary
- League of Women Voters
- Junior League
- Jaycees
- Federation of Women's Clubs

6. Chamber of Commerce

- (City) Chamber of Commerce
- State Association of Mexican American Chambers of Commerce or ethnic groups

7. Education

- Medical schools
- Culinary schools
- Parent/Teachers Association/Organization
- Association of Secondary School Principals
- Colleges and universities—nutrition and meat science departments
- Association of Private Schools
- Association of School Administrators
- Association of School Foodservice Directors
- Classroom Teachers Association
- Community/Junior Colleges
- Vocational Agriculture Teachers Association
- Young Homemakers

8. Government

- House of Representatives and Senate
- (State) Committee on Agriculture and Livestock
- (State) Committee on Public Health

STRATEGY 2. Develop and implement a plan to contact NEWSPAPER EDITORS of major daily newspapers in each targeted city in your state to secure placement of a series of articles on lean meat (based on modules). Articles may be written by Extension staff, or "brokered" to a reporter. Sample articles are included in this notebook. **HOWEVER, COMPETING NEWSPAPERS MUST NEVER BE GIVEN THE SAME ARTICLE AS AN EXCLUSIVE FEATURE.**

Targeted editors most often will include the food, lifestyle, business and/or feature editor of the newspaper. PERSONAL CONTACTS ARE BY FAR THE MOST SUCCESSFUL WAY OF SECURING FEATURE STORIES.

Effective stories often highlight members of the community. In the case of stories on meat, consider highlighting the following types of people with personal stories, especially as related to their experience with the Extension Service, or information obtained from the Extension Service:

- Heart patients
- Nutritionists
- Physicians
- Senior citizens
- Local meat producer
- Meat packer/processor/purveyor
- Retail grocery store operator
- Restaurant owner or chef
- Long-distance runner
- Well-known athlete (basketball, football, track, baseball)
- Mother with school-age children
- Active, single professional
- Meat inspector
- Physical fitness instructor
- High school home economics teacher
- Pastor/priest/rabbi
- President of a local food company

STRATEGY 3. Develop and implement a plan to contact magazine editors to secure placement of articles on meat in the following types of magazines:

- Consumer magazines—food/lifestyle sections
- Business magazines
- Trade magazines—(see listing of organizations in strategy #1.)
- City magazines
- City versions of consumer magazines (i.e., Houston Home and Gardens)
- State or local agricultural magazines

The story angle for each publication should be different and should be tailor-made for a targeted audience. IN MOST CASES, IT WILL BE NECESSARY TO CONDUCT YOUR OWN RESEARCH TO DETERMINE THE TARGET AUDIENCE OF THE MAGAZINE. Your story should be targeted to this group and their specific interests, needs and lifestyles.

Possible magazine or newspaper story ideas include:

- "Antibiotics and Hormones in Meat Animals—The Benefits and the Risks"
- "Consumer Confusion—Just What is the Nutritive Value of Meat?"
- "The Meats of the 1990s—Getting the Fat Out"
- "Lines of Defense That Keep Our Meat Supply Safe and Wholesome"
- "Tips on Selecting Good Tasting Lean Meats"
- "Fitting Lean Meat into Trim Shopping Budgets"
- "Meat Cookery—The Science Behind the Sizzle"
- "Hot New Trends in Cooking Meats"
- "Handling and Storage of Meat—Keep It Safe and Tasty"
- "Meats—Safe from Store to Table"
- "Convenient At-Home Meats—Are They Worth the Difference?"
- "Retort Technology: Meat's Performance Under Pressure"

- "Shopping a la Carte—Take-Out Meats"
- "Nutrinomic Comparison of Protein Costs—How Does Meat Measure Up?"
- "A New Generation of Convenience Entrees and Dinners"
- "Eating Out—Your Guide to Good Eating"
- "Meat Labeling—What's in a Name?"
- "Cooking Meats—Making a Good Thing Better"
- "Eating Meat on a Low-Cholesterol Diet?"
- "Nutrient-Dense Meats—What Does It Mean?"

STRATEGY 4. Based on target audience of radio stations, develop and implement plan to contact **targeted radio broadcasters** to run series of radio clips based on the information in the modules on meat. It may be easier to tape the radio clips in one sitting, and then **HAND-DELIVER** them one at a time in accordance with the schedule determined in cooperation with the radio broadcaster(s). You may elect to use the suggested radio clips found in each module, or develop your own. Again, slant the clip to the **TARGET AUDIENCE** of each radio station. Story angles may be similar to those used in working with newspapers and/or magazines (see strategies above).

STRATEGY 5. Produce video spots to be aired on television and market these spots to **SELECTED TELEVISION BROADCASTERS** based on viewing audiences for particular times of the day. Ideally, the spots should be in sequence according to meat topic. Several spots per module could be developed, if time and resources are available. (See individual modules for suggested video topics.) Again, **PERSONAL CONTACT OF BROADCASTERS AND HAND-DELIVERY OF TAPES** is essential in most cases to increase chances of securing air time.

If the topic is "hot" and of immediate concern to viewers, you may be able to secure time during the news. For example, the European import ban on beef receiving hormone implants in January 1989 would have been a perfect time to air a clip based on the information in Module I. Or, if there has just been an incident of food poisoning in a restaurant or with deli items, a clip on proper handling and storage of meat based on the information in Module III might make the evening news.

STRATEGY 6. Conduct a major program or activity in cooperation with another organization or group and develop a media packet to be hand-delivered to key individuals in the media to secure coverage of the event. When appropriate, ask media celebrities to participate in some capacity (i.e., panel moderator, guest speaker) during the event. The media package should include:

- Fact sheet (dates, times, participants, key contacts)
- Background fact sheet on the event itself and on the organizations involved
- Schedule of events
- News stories event and topic discussed (Print: 1 to 1 1/2 typed pages, double-spaced; Broadcast: 1 to 2 short paragraphs.)
- List of program participants and responsibilities
- Photographs of key participants—8 x 10 black and white glossies or 5 x 7 headshots.
- One page of highlights in "bullet" form
- Brochures, pamphlets, etc.

STRATEGY 7. Develop and implement a plan to contact radio and television stations to schedule personal appearances on talk shows as an expert on meats. You may want to "team up" with another "expert" on the particular topic you will be discussing. Use a planning grid to coordinate schedules of talk show appearances with placements of articles

in newspapers and magazines as well as scheduling of programs and activities relating to each lean meat topic. For example, if the meat topic for the month of March is "The Nutritional Contributions of Meat to the Diet," then plan to have live presentations, workshops, newsletter series, newspaper articles, magazine articles, radio and television clips, AND personal appearances on radio and television ALL on nutritional contributions of meat. Use various story angles for each.

Then, in May, have all of your work on meats center on "Food Safety as Related to Meat and Meat Products." "Proper Preparation and Storage of Meats" or "Antibiotics and Hormones in Meat Animals—The Benefits and the Risks" or "The Latest in Convenience Meat Products" might be topics for other months.

STRATEGY 8. Write and place series of articles based on the materials in the modules in NEWSLETTERS of various types. These newsletters may be published by Extension, commodity groups, special interest groups, grocery stores (handed out at the check-out stand), hospitals, weight control clinics, colleges, culinary schools, libraries, service clubs, the Chamber of Commerce or other type of group or organization. This could be part of the overall cooperative effort with a group or organization. **BE SURE TO GAIN PROPER CREDIT FOR BOTH YOURSELF AND YOUR ORGANIZATION FOR HAVING WRITTEN THE ARTICLE.**

STRATEGY 9. Conduct a MEDIA EVENT on various meat-related topics (perhaps in cooperation with other organizations or groups) to inform the media on these topics and to showcase programs conducted by Extension. Media events require careful planning and a great deal of time and care should be taken to see that every detail is covered. Media events should only be conducted when new and valuable information is released. Be prepared to offer additional assistance to the media if asked to do so. AND, follow-up with the media after the event is essential. The follow-up may be in the form of a questionnaire, a personal phone call or visit, sending additional information, providing names and phone numbers of people to feature, providing story angle ideas, setting up photography sessions, etc.

STRATEGY 10. Apply for and obtain CONTINUING EDUCATION CREDIT from professional organizations or colleges for seminars, short-courses, workshops, in-service training sessions or other activities relating to meat education. Widely publicize the fact that continuing education credits will be awarded in all promotional materials and correspondence with professional organizations, groups and individuals. Whether or not continuing education credit is given, be sure to give CERTIFICATES OF COMPLETION for the type of educational activities listed above. For some audiences, the fact that they will receive a certificate is the incentive to take and/or complete the course.

STRATEGY 11. KEEP ELECTED OFFICIALS INFORMED of Extension programs and activities (in this case, those related to meats) and keep them informed of Extension success stories by sending copies of feature stories, listings of radio/television appearances, short descriptions of key cooperative efforts with other organizations, groups, businesses or agencies, etc. Indicate the relationship of these activities to the National Initiatives of the Cooperative Extension System and the identified state and county critical issues. In some cases, elected officials may be included in specific activities by giving them a visible, active role such as keynote speaker, member of a panel or part of a team appearing on a television or radio talk show.

D. Instructor/Extension Agent Program Evaluation

Thank you for using "*The Consumer's Choice-Lean Meat*" modules for instructing your clientele on various meat topics. Your input concerning the usefulness of the modules and the support materials will be very helpful in the overall evaluation of the program, any subsequent revisions, and the development of future educational materials.

Please return this form as soon as possible after teaching the modules to:

Beth Branthaver
National Program Leader, Food Marketing
USDA Extension Service
Room 3443-South Building
Washington, DC 20250-0900

Date: _____

Name and Title: _____

Organization: _____

Address: _____

Phone Number: _____

PLEASE COMPLETE THE FOLLOWING:

Which module(s) did you use (partially or totally):

_____ Module I: "The Livestock Industry: Production of Lean, Wholesome Meat for the Consumer"

_____ Module II: "Meat, Nutrition and Your Health"

_____ Module III: "Making Sense of Meat Purchases"

_____ Module IV: "Preparation of Today's Lean Meat"

_____ Module V: "Meat: A Convenience Bill of Fare"

How many classes/sessions/programs were taught? _____

Number of different audiences: _____

Total number reached through live presentations: _____

List the types of audiences reached _____

Types of media used for press releases and announcements of programs: _____

List of feature stories and/or broadcast features: _____

Was the information in the modules relevant to the concerns of your clientele? _____

Please explain: _____

Was the information in the modules complete? _____ If not, please indicate the information that was missing from the modules: _____

Were the modules and suggested teaching methods easy to implement? _____

If not, explain additional preparation necessary to teach modules: _____

What did you like most about the materials? _____

What did you like least about the materials? _____

Suggestions for improvement: _____

Based on the modules you taught, please evaluate the usefulness of the following components on a scale of 5 to 1 (5=Excellent, 1=Poor):

COMPONENT	5 EXCELLENT	4 GOOD	3 AVERAGE	2 FAIR	1 POOR
Objectives					
Background Information					
Preparation Guides					
Lesson Plans					
Learning Experiences					
Target Audiences					
Handout Samples					
Fact Sheets					
Publicity Materials					
Supplementary Resources					
Marketing Strategies					
Overall Program					

THANK YOU

E. Credits

1. Module I: The Livestock Industry: Production of Lean, Wholesome Meat for the Consumer

- a. Unit 1. Move Toward Leanness in the Livestock Industry
- b. Unit 2. Meat Safety and Wholesomeness

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2. Module II: Meat, Nutrition and Your Health Module

- a. Unit 1. Meat Nutrition—Overview

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- b. Unit 2. Meat Nutrition—Fats and Cholesterol in the Diet
- c. Unit 3. Meat Nutrition—Sodium in the Diet

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3. Module III: Making Sen\$e of Meat Purchases

- a. Unit 1. Meat Cut Identification and Evaluation
- b. Unit 2. Shopping for Lean Meat

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4. Module IV: Preparation of Today's Lean Meat

- a. Unit 1. Meat Cookery
- b. Unit 2. Proper Handling and Storage

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5. Module V: Meat: A Convenience Bill of Fare

- a. Unit 1. A New Generation of Convenience Entrees and Dinners
- b. Unit 2. Shopping a la Carte: Take-Out Meats
- c. Unit 3. Eating Out: Your Guide to Good Eating

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MODULE I

The Livestock Industry: Production of Lean and Wholesome Meat for the Consumer

American consumers are increasingly concerned with the healthfulness of their diet. The amount of fat in the diet is of particular concern to most health conscious consumers. In light of this concern about fat consumption, the value of meat in the diet has been under scrutiny because beef, pork and lamb are perceived as containing large amounts of fat. In part, the reason for this skepticism has been the use of outdated nutrient data. Much of the data that have been used by health professionals and the public were collected in the 1950s. There have been numerous changes in the livestock and meat industries since the 1950s.

Today's consumer finds meat products tailored more to consumer preferences for lean meats. This move toward leaner meat can be seen in all phases of the food chain, from the consumer to the livestock rancher or farmer. For example, at the retail level it has been shown that the average beef cut had 1/8 inch of external fat in 1988 compared to 1/2 inch of external fat in 1986. This is a direct result of consumer demand for a leaner product.

In turn, the packer is looking for new and more efficient methods of removing fat from wholesale meat cuts before they reach the supermarket. Because of packer economic pressure, the producers and feeders of livestock are examining innovative management schemes and evaluating the genetics of their herds more closely to produce leaner animals.

Leanness is only one criterion a health conscious consumer uses when making a meat purchase decision. Another consideration is the safety and wholesomeness of the foods they purchase, including meat products. Consumers are confused about the safety and wholesomeness of the meat offered in the retail case of their local supermarkets. Use of antibiotics and hormones in livestock production is of particular concern. Consumers often are unaware of safeguards used to ensure a safe and wholesome meat supply.

The purposes of this module are to:

- Increase understanding about the move toward leanness in the livestock industry (Unit 1).
- Learn how the government and livestock and meat industries ensure a meat supply that is safe and wholesome (Unit 2).

Unit 1. Move Toward Leanness in the Livestock Industry

Contents

	Page
Objectives	3
Concepts	3
Background Information	4
• Livestock Ranchers, Farmers and Feeders Ask Consumers About Meat	4
• Retailers Respond to the Consumer	4
• New USDA Handbook 8 Beef, Pork and Lamb Nutrient Data	4
• Packer Response to the Retailer	6
• Packers Send the Leanness Signal to Producers	6
Leader Lesson Plan	8
• Advance Preparation Guide	8
• Presentation Guide	8
Handouts	10
• Evaluation Instrument	
• Nutrient Profile of Beef, Pork and Lamb with Different Fat Cover Levels	
• The Livestock Industry Move Toward Leanness Summary Sheets	
• Lean Meat Seek and Find	
• Myths About Lean Meat	
Suggested Learning Experiences	11
Supplementary Resource Materials	13
Evaluation Instrument	14
References	15

Unit 1. Move Toward Leanness in the Livestock Industry

Objectives

After completion of Unit 1, participants will be able to:

- 1 Describe ways in which the livestock industry is directing more attention to producing a meat product that meets consumer preferences.
- 2 Identify how fat levels on retail meat cuts have been dramatically reduced.
- 3 Explain why removing the fat from meats creates a more healthful product for the consumer.
- 4 Summarize the changes in the meat industry from retailers to packers to producers as a result of consumer demand for lower fat content in beef, pork and lamb meat products.
- 5 Describe how the producer and the packer are trying to respond to consumer demands by removing that fat before it reaches the retail case.
- 6 Locate the latest research findings regarding the fat, fatty acid, cholesterol and calorie content of lean pork, beef and lamb.

Concepts

- 1 Some consumers, nutritionists and health professionals are unaware of changes taking place in the livestock industry.
- 2 The move toward leanness in the livestock industry—from retailer to producer—has produced lower fat meat products that still provide an excellent source of protein, B-complex vitamins and minerals.
- 3 The move toward leanness began when livestock producers sponsored research which found that consumers preferred more closely trimmed meat cuts.
- 4 Soon after the producer-sponsored research was released, retail meat cuts became leaner. For example, the average beef retail cut now has only 1/8 inch of fat cover compared to 1/2 inch in 1986.
- 5 Packers are beginning to respond to retail meat managers who want more of the fat removed before the meat cuts reach the local grocery stores.
- 6 A small amount of fat (3 percent) is required inside the muscle (marbling) in the more tender meat cuts to ensure consumer acceptance from a taste appeal standpoint. Cuts with less fat are more variable in tenderness, juiciness and flavor.
- 7 Producers are using genetic selection to produce leaner offspring. Instruments, such as an ultrasound machine adapted from the human medical field, are being developed and used to identify herd or flock replacements for future breeding purposes that will produce leaner offspring. Also, producers are developing management systems which promote the production of lean meat.

Background Information

Today's consumers are increasingly concerned with the healthfulness of their diet. The amount of fat in the diet is of particular concern to most health-conscious consumers. In light of this concern about fat consumption, the value of meat in the diet has been misunderstood because beef, pork and lamb are perceived to contain large amounts of fat. In part, the reason for this misconception is the use of outdated nutrient data. The data that have been used by health professionals and the public were collected in the 1950s. This was the only official USDA nutrient composition information available on beef, pork and lamb. Unfortunately, those data reflect the livestock practices, laboratory techniques and retail cutting and trimming styles in existence at that time.

Since the 1950s, there have been many changes in each aspect of the livestock industry – retailer, packer and producer. New methods of livestock management combined with current cutting and trimming techniques have resulted in leaner meat being offered to consumers at the retail level. Recently, these changes were recognized and a new data set was developed on the nutrient profile of beef, lamb and pork meat cuts. This is why many consumers, nutritionists and health professionals are hearing conflicting reports—depending if new or old data are cited—about the healthfulness of beef, pork and lamb. This unit will discuss how each segment of the livestock industry is striving to provide consumers with leaner meat products.

Livestock Ranchers, Farmers and Feeders Ask Consumers About Meat

The move to provide consumers with leaner, more healthful meat products began when livestock producer organizations sponsored consumer preference research and surveys to find out what consumers desire in meat products.

The National Consumer Retail Beef Study found that consumers believed the meat presented at retail meat counters was too fat. A survey, called the "Consumer Climate For Meat," showed that 50 percent of meat consumers fit into active or health-oriented lifestyles. Both groups consider the health

aspects of meat carefully before making their purchase decisions, but for different reasons. Those in the active lifestyle group are concerned about their weight and pay close attention to calorie consumption, while the health-oriented group is conscious about cholesterol and fat from a disease prevention standpoint. These findings served as the impetus to the most dramatic change ever in the fat content and, subsequently, in the nutrient profile of cuts offered at the retail meat case.

Retailers Respond to the Consumer

As a direct result of the National Consumer Retail Beef Study findings and other consumer preference survey findings, several national grocery chains responded to consumer demands by featuring more closely trimmed meats. Since that time, 85 percent of all retail stores report that they are on some type of closer trim retail meat program.

A war on fat (retailers competing to provide the trimmest beef) has developed between retailers to such an extent that several are presenting totally trimmed retail cuts at the meat counter. In 1988 the findings of the National Beef Market Basket Survey, which investigated the fatness of beef in 12 U.S. cities, were released. Investigators reported that the average external fat thickness left on beef retail cuts was 1/8 inch, with 42 percent of the cuts examined having no external fat. Furthermore, it was reported that during the period of 1986 to 1988 the total fat content of retail beef cuts had decreased by 27 percent. National Lamb and Pork Market Basket surveys found similar trends among pork and lamb retail cuts.

New USDA Handbook 8 Beef, Pork and Lamb Nutrient Data

The National Beef Market Basket Survey reported that the average fat cover left on today's meat after trimming is 1/8 inch. Other research indicates that fat on retail cuts is not only trimmed at the grocery store but also at home. Approximately 81 percent of consumers trim some fat from meat cuts, with 66 percent trimming almost all fat. As beef, pork and lamb retail cuts are trimmed more closely, the

Table 1. Nutrient profile of broiled top loin steak, pork loin chop and lamb loin chop: lean only and lean and fat as described by USDA.^{ab}

Nutrient	Amount in 3-ounce, broiled serving					
	Top loin steak (Choice)		Pork loin chop		Lamb loin chop	
	Lean ^a	Lean and fat ^b	Lean	Lean and fat	Lean	Lean and fat
Calories	176	243	196	275	183	268
Protein, g	24.3	21.8	27.2	23.3	25.5	21.4
Total fat, g	8.0	16.6	8.9	18.8	8.3	23.1
Saturated						
fatty acids, g	3.2	6.9	3.1	6.8	3.0	8.4
Monounsaturated						
fatty acids, g	3.3	7.3	4.0	8.6	3.6	2.7
Polyunsaturated						
fatty acids, g	.28	.61	1.1	2.1	.5	1.4
Cholesterol, mg	65	68	83	82	80	85

^a Lean - the nutrient content of a steak or chop in the separable lean portion only.

Described in USDA Handbook 8 series as lean only.

^b Lean and fat - the nutrient content of a steak or chop including lean, external fat and seam fat up to 1/2 inch of fat.

Described in USDA Handbook 8 series as lean and fat.

Data obtained from USDA Handbooks 8-10, 8-13 and 8-17.

nutritive value increases proportionately. Unfortunately, the fat, cholesterol and calorie content of meat reported in the old version of USDA Handbook 8, published in the 1950s, often included cuts with up to 1/2 inch of external fat and greatly misrepresented meat's contribution of fat to the American diet.

To more closely reflect the true nutrient contribution of beef, pork and lamb, a 1986 version of the USDA Handbook 8 was developed. USDA Handbook 8-13 contains beef nutrient information; 8-10, pork information; and the nutrient profile of lamb is published in Handbook 8-17. In the new beef, pork and lamb publications, the nutrient profile is reported on a "lean only" basis and on a "lean and fat" basis. The lean and fat data would represent the calorie, fat, cholesterol, protein, mineral and vitamin content of beef, pork and lamb retail cuts with up to 1/2 inch of fat cover, similar to the way in which cuts were prepared for the 1950s version of USDA Handbook 8.

Table 1 shows an example of the "lean only" and "lean and fat" nutrient profile of a beef strip loin steak and a center loin pork chop. Note that the grams of fat found in the "lean and fat" figures are double that found in "lean only" figures. Figure 1 demonstrates that the cholesterol content of the cooked, lean portion of different meats is similar.

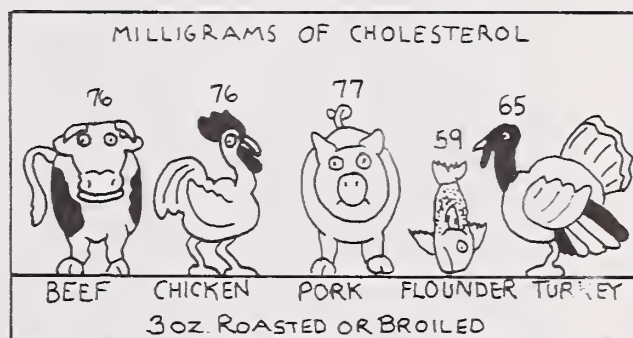


Figure 1. Cholesterol content in muscle foods—3 ounces, cooked lean.

The public may obtain more healthful meat products by selecting cuts with the most lean and least fat. The American Heart Association mentions in its dietary recommendations that lean meats (the red portion) can fit in the American diet, even for those Americans on special diets. More nutrition information can be found in Module II "Meat, Nutrition and Your Health."

Packer Response to the Retailer

So far we have discussed how meat retailers are removing much more fat today than even a few years ago. During a 2- to 3-day period, retailers across the country trim 1.2 million more pounds of fat now than they did in 1986.

Retailers often receive meat cuts from the packer in the form of large wholesale cuts (for example, round, top round, short loin, strip loin, tenderloin and top sirloin). These cuts leave the packing house in boxes. Once the boxes are received, the retailer removes the cuts from the box and debones, trims and cuts the entire carcass into steaks, roasts and miscellaneous cuts (such as ground beef and stew meat) and then places them in the meat case. The packer in most cases has been able to deliver beef, pork and lamb with up to 1 inch of fat cover on each cut to the retailer, which gives the local meat market manager the responsibility of trimming each cut to an acceptable level of fat before presenting to the consumer.

The retailer is slowly passing the consumer's signal to the packer that "fat is out and lean is in." As a result, beef, pork and lamb packers are starting to trim more fat at their level and, thus, are sending fewer pounds of fat to the retailer. For instance, many boxed pork cuts—wholesale pork cuts shipped in a box—are trimmed to less than 1/4 inch of external fat. One beef packer has reduced the maximum fat level in boxed beef cuts sent to the retailer from 1 inch to 1/2 inch of external fat. Lamb packers are beginning to identify carcasses that qualify as lean lamb and are marketing those under a certified label. Packers are removing more bones to create more boneless wholesale cuts. Studies show that as more bones are removed, more seam fat (fat found between muscles) is trimmed in the process.

Packers are attempting to remove fat from the livestock they receive in two ways:

1. Removing fat at the packing house with a knife.
2. Penalizing the livestock producer for excessively fat cattle, hogs and sheep.

The latter has allowed the consumer's demand for leaner livestock to be sent to the producer.

Packers Send the Leanness Signal to Producers

Although the move toward leanness on the ranch, farm and feedlot has recently escalated, it really began in the 1950s. Photographs of cattle from the 1950s show a short-legged, deep-bodied, over-fattened steer, instead of the taller, more muscular, leaner steer of today. Consumers of the 1950s were not critical of retail beef cuts with excess external fat, seam fat or marbling. In fact, a premium was paid for those cuts with the greatest quantity of marbling. Possibly, consumers believed that if a little fat inside the steak was good, then more marbling was even better. Pigs and sheep also were over-fattened and were short and dumpy in appearance. The post-World War II era saw a great many new products appear on grocery store shelves.

Oils extracted from plants — one new group of products — led to a dramatic change in the livestock industry. Before this, the pig was prized for its ability to fatten because lard was used extensively in cooking and in producing gunpowder during the war. The increased production and use of vegetable oils caused a rapid decline in the value of pork fat and beef fat, thus beginning the move toward leanness in hogs and cattle.

In the late 1960s and 1970s there was a renewed surge in producing leaner livestock. Livestock producers began to select and produce livestock that would grow more quickly and were more efficient in converting grain and hay to body weight gain. Because livestock can gain a pound of lean more economically and efficiently than they can put on a pound of fat, this has resulted in leaner livestock.

The most recent surge in producing leaner livestock has been more direct. The packer, feeling pressure from the retail sector to ship boxed meat cuts with less fat, is in turn penalizing livestock producers and feeders who market over-fattened cattle, sheep and hogs. Packer discrimination against excessively fat livestock will continue to intensify as retailers become even more resistant to accepting beef, pork and lamb cuts with excess fat. One major packer has developed a new cattle buying system that utilizes a fat measurement and a muscle score, resulting in payment incentives to producers who raise leaner animals. Several pork processors are paying for leaner pigs and

discounting over-fattened pigs by using a carcass backfat measurement—a measure of fat cover on the carcass—as a leanness indicator.

Although leanness is an important consideration in determining if an animal should go to market, it is not the only criterion used to determine the value of livestock. Indeed, a consumer might ask why the price a producer is paid for livestock is not exclusively based on the leanness of the cattle, hog or lamb. Undoubtedly, health care professionals would prefer that consumers eat meat with no fat; however, consumer acceptance is often a problem with extremely low fat meat products. Cooked lean (low fat) meat products are often tough, dry and undesirable in flavor.

The first priority of the beef, pork and lamb industries is to provide wholesome meat to the consumer with acceptable taste appeal. A review of more than 50 research studies indicates that retail cuts (rib and loin cuts) which are generally cooked using dry heat methods (broiled, grilled, fried or roasted) require a minimum of 3 percent fat inside the lean (marbling) to assure acceptable taste appeal. Steaks and roasts with less than 3 percent fat tend to be more variable in tenderness, juiciness and flavor. This has prompted packers to demand a minimum level of marbling (fat inside the muscle) in addition to leanness.

With respect to beef, the actual quantity of marbling in steaks required for desirable eating quality may be related to the geographic region of the United States. In 1987 meat researchers examined consumer taste perceptions of 700 cooked strip loin steaks representing seven degrees of marbling (slightly abundant, moderate, modest, small, slight, traces and practically devoid). The study involved residents of San Francisco, Kansas City and Philadelphia. Research findings suggested that consumers in

Philadelphia were more critical of the taste of beef from the lower marbling scores than consumers studied in San Francisco and Kansas City. It is unfortunate that leanness and taste have been found to be somewhat contrary. This is why livestock producers and packers are unwilling to sacrifice eating quality by selecting and paying for leaner animals exclusively.

Livestock owners are more closely examining the genetics of their herds and flocks, trying to identify individuals that will produce offspring which will minimize fatness and maximize taste appeal. Ultrasound technology, once used exclusively in the medical field, has been adapted by the livestock industry. It is beginning to be used by cattle, hog and sheep producers to examine the muscularity and leanness of potential herd replacement that will be used in the future as breeding stock. Ultrasound performed by a trained technician allows the rancher or farmer to view the size of muscles and thickness of external fat cover on the back of live animals. This information allows the livestock producer to identify herd replacements that are genetically superior in leanness and muscling, and assist the livestock feeder in determining when cattle should go to the market.

In the future, livestock may be fed in a manner which alters the fatty acid composition of the lean. Research suggests that the types of feeds that livestock eat (such as canola oil and rapeseed) may alter the fat make-up of cattle, hogs and sheep by causing an increased deposition of monounsaturated fatty acids in the animals' fatty tissue. Growth implants (discussed further in Unit 2) are also used in cattle to increase growth rates of muscle tissue and subsequently decrease the rate of fat deposition in the animal. These are examples of the ways in which new livestock management practices enhance the leanness of livestock.

Leader Lesson Plan

Advance Preparation Guide

1. Review all materials in Unit 1. Move Toward Leanness in the Livestock Industry.
2. Examine the activity and interest getter prior to the meeting to better understand the subject matter, concepts, objectives and method of presenting the information.
3. Ask a local grocery store manager to donate the meat cuts for the program. The cuts could be given away as door prizes during the program. The meat cuts that will be needed are:
 - Three strip loin steaks, also called top loin steaks
 - One steak with 1/2 inch fat cover
 - One steak with 1/4 inch fat cover
 - One steak with 0 inch of fat cover
 - One chuck blade steak with a large amount of seam fat
4. If possible obtain a copy of the National Live Stock and Meat Board publication, **Nutrient Values of Muscle Foods**, which contains some of the nutrient composition data for beef, pork, lamb, veal, poultry and fish. This information is taken from the updated USDA Nutrient Content Handbook 8 series.
5. Make an appropriate number of copies of the evaluation instrument and the following handouts:
 - Nutrient Profile of Beef, Pork and Lamb with Different Fat Cover Levels
 - The Livestock Industry Move Toward Leanness Summary Sheets
 - Lean Meat Seek and Find
 - Myths about Lean Meat
6. Contact state beef, pork or lamb industry councils for exhibits, written publications and audio/visual materials.
7. Order additional references and publications as you deem necessary.
8. Check newspapers for current and pertinent information to use as additional information and as attention getters.
9. Decide which additional learning experiences you will use and assemble material described in that section of this unit.
10. Obtain poster board and marker or overhead transparency, overhead projector and transparency markers.

Presentation Guide

Setting the Stage

PRE-TEST: Allow participants 5 to 10 minutes to complete the evaluation instrument. (See page 14.)

To get the audience's interest, ask the following:

1. What are the most important factors that they consider when purchasing meat products? Write the factors mentioned on a poster board or overhead transparency.
2. Which steak/chop they would prefer to purchase and why? Show two strip loin steaks or two center loin pork chops. One of the steaks or chops should have 1/2 inch of outside fat cover and the other should have no outside fat cover.
3. If the steak with 1/2 inch of fat were purchased how much fat would they consume—none, some or all?
4. Are there any differences in the nutrient composition between the two steaks/chops and what might those differences be?

Teaching Steps

Explain in your own words the objective of this unit, and briefly discuss the key concepts that will be covered as described earlier in this section.

- HANDOUT:
- Nutrient Profile of Beef, Pork and Lamb with Different Fat Cover Levels
 - The Livestock Industry Move Toward Leanness Summary Sheets
 - Lean Meat Seek and Find
 - Myths about Lean Meat

DISCUSS: **The Livestock Move Toward Leanness Summary Sheets.** Begin by referring to the responses that the audience gave to the first question in the attention getter (factors in selecting meat).

DISCUSS: **Consumer to retailer.** Use the display of steaks/chops with 1/2 inch of fat cover and 1/4 inch of fat cover to discuss the meat retailer response to the research and survey findings—how 85 percent of the grocery stores have moved from leaving 1/2 inch of fat cover on retail cuts to now leaving only 1/4 inch of outside fat. Discuss the consumer preference research that says the average beef retail cut has 1/8 inch of fat cover.

DISCUSS: **Retailer to packer.** The retailer is beginning to put pressure on the packer to trim more fat off wholesale cuts before they are delivered to the retailer. Talk about the way in which wholesale cuts are shipped to the retailer and what the retailer must do to prepare the meat for the consumer. Mention that traditionally the retailer has allowed 1 inch of fat cover on wholesale cuts shipped to them. Describe some

of the new closer trim programs being offered by packers to retailers.

DISCUSS: **Packer to producer.** Show pictures of cattle/hogs from the 1950s and 1980s. Discuss why animals were fat in the 1950s and the changes that have occurred to cause the leaner animals seen today. Emphasize the use of ultrasound to identify leaner livestock. Explain that the packer buys livestock according to estimated taste appeal as well as on leanness.

DISCUSS: **Marbling and lean.** Show photograph of three steaks with marbling levels from 3 to 7.5 percent fat inside the muscle (marbling). Mention that research suggests that a minimum of 3 percent fat is required to have acceptable taste in cuts that require dry heat cookery. Point out that USDA defines lean meat as a meat product that contains less than 10 percent fat; therefore, all three steaks pictured would qualify as lean meat. The range of marbling within the photographs is typical of the level found in the meat case. This picture points out that when the fat cover is removed, beef, pork and lamb will be lean and still have excellent eating quality.

COMPARE: **Nutrient Profile.** Show steaks/chops with 1/2 inch and 0 inch of fat cover. These are the same cuts shown at the beginning. Demonstrate what the livestock industry's move toward leanness means to the consumer by comparing the nutrient profile of the two steaks/chops (Table 1). The lean figure represents a cut that would have 0 inch of fat cover and the lean and fat figure represents cuts with up to 1/2 inch of fat cover. Summarize the changes that are occurring to produce a leaner and more healthful product for the consumer.

Handouts

- Evaluation Instrument
- Nutrient Profile of Beef, Pork and Lamb with Different Fat Cover Levels
- The Livestock Industry Move Toward Leanness Summary Sheets
- Lean Meat Seek and Find
- Myths About Lean Meat



Evaluation Instrument

Unit 1, Pre-Post Test

Code/Name _____

Telephone _____

- | | | | |
|-----|---|---|---|
| 1. | T | F | Livestock producers sponsor research to determine consumer likes and dislikes about meat. |
| 2. | T | F | There has been no change in the body fat content of cattle, sheep and hogs for more than 30 years. |
| 3. | T | F | Most consumers are not concerned about the fatness of meat cuts. |
| 4. | T | F | The average beef retail cut in the U.S. has 1/8 inch of outside fat cover. |
| 5. | T | F | A steak with 0 inch of fat cover has less than half the fat content of a steak with 1/2 inch of outside fat cover. |
| 6. | T | F | Lean meat is a good source of protein. |
| 7. | T | F | Every 2 to 3 days, retailers across the country are collectively trimming 1.2 million more pounds of fat than in 1986. |
| 8. | T | F | Packers penalize the producer for marketing excessively fat market animals. |
| 9. | T | F | The price a livestock owner is paid for market animals is based exclusively on leanness. |
| 10. | T | F | Until recently the retailer was expected to do most of the trimming of fat from meat cuts. |
| 11. | T | F | Livestock producers use medical ultrasound instruments to identify leaner cattle, sheep and hogs. |
| 12. | T | F | A meat product that usually is cooked by broiling should have at least 10 percent fat inside the muscle to have acceptable beef eating quality. |
| 13. | T | F | The type of fatty acids (saturated, monounsaturated and polyunsaturated fatty acids) that a hog deposits can be altered by the type of grain in the diet. |
| 14. | T | F | It is difficult to find meat cuts which fit the U.S. Department of Agriculture's definition for lean meats (meat product with less than 10 percent fat). |
| 15. | T | F | The cholesterol content found in 3-ounce cooked lean servings of beef and chicken are similar. |

INDUSTRY



Evaluation Instrument Key: Unit 1

1. T
2. F, Livestock have considerably less body fat today than compared to the 1950s.
3. F, Health concerns are primary to at least 50 percent of the U.S. population.
4. T
5. T
6. T
7. T
8. T
9. F, The price is also based on estimated eating quality.
10. T
11. T
12. F, A broiled meat product only needs 3 percent fat inside the muscle.
13. T
14. F, Many cuts with no outside fat cover may meet the standards.
15. T



Nutrient Profile of Beef, Pork and Lamb with Different Fat Cover Levels

Table 1. Nutrient profile of broiled top loin steak, pork loin chop and lamb loin chop: lean only and lean and fat as described by USDA.^{ab}

Amount in 3-ounce, broiled serving						
Nutrient	Top loin steak (Choice)		Pork loin chop		Lamb loin chop	
	Lean ^a	Lean and fat ^b	Lean	Lean and fat	Lean	Lean and fat
Calories	176	243	196	275	183	268
Protein, g	24.3	21.8	27.2	23.3	25.5	21.4
Total fat, g	8.0	16.6	8.9	18.8	8.3	23.1
Saturated fatty acids, g	3.2	6.9	3.1	6.8	3.0	8.4
Monounsaturated fatty acids, g	3.3	7.3	4.0	8.6	3.6	2.7
Polyunsaturated fatty acids, g	.28	.61	1.1	2.1	.5	1.4
Cholesterol, mg	65	68	83	82	80	85

^a Lean - the nutrient content of a steak or chop in the separable lean portion only.

Described in USDA Handbook 8 series as lean only.

^b Lean and fat - the nutrient content of a steak or chop including lean, external fat and seam fat up to 1/2-inch of fat. Described in USDA Handbook 8 series as lean and fat.

Data obtained from USDA Handbooks 8-10, 8-13 and 8-17.

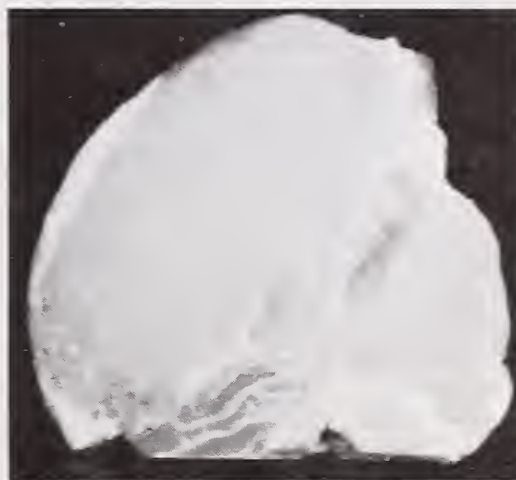
INDUSTRY



The Livestock Industry Move Toward Leanness Summary Sheets

Consumers Speak Out to Livestock Producers

The move toward leanness in the livestock industry began in the 1980s when livestock producers sponsored research that asked consumers what they looked for and wanted in a meat product. A large percentage of consumers said leanness was important in a meat product. When the fat is removed from the outside of the retail cut, as shown in the pictures below, it greatly reduces the fat and calorie content of these meats.



Retailers React to Consumer Demand for Leaner Meat

Almost immediately after the release of these consumer research findings, retailers began offering consumers meat cuts that were more closely trimmed of fat cover. The standard before this point was believed to be 1/2 inch fat cover. Now some retailers are offering meat cuts with no (0 inch) outside fat cover. The average beef retail cut in the U.S. has only 1/8 inch fat cover. When retail meat cuts are totally trimmed of outside fat cover, the single muscled cut, like those shown below, will qualify for a United States Department of Agriculture "lean meat" label (meat product with 10 percent or less fat). The fat levels shown below are typical of what is normally seen at retail meat counters across the United States.



3 percent fat



5 percent fat



10 percent fat

INDUSTRY

Packers Get into the Act

Until recently, the packer was able to leave 1 inch of outside fat cover on the wholesale meat cuts sent to the retailer. Packers are beginning to remove more fat on boxed beef, pork and lamb wholesale cuts. Some meat packers are sending the leanness signal to the livestock producer by putting more emphasis on animal leanness when determining the price paid for cattle, sheep and hogs going to market.



1950s



Today's

Livestock Producers Become Consumer Driven

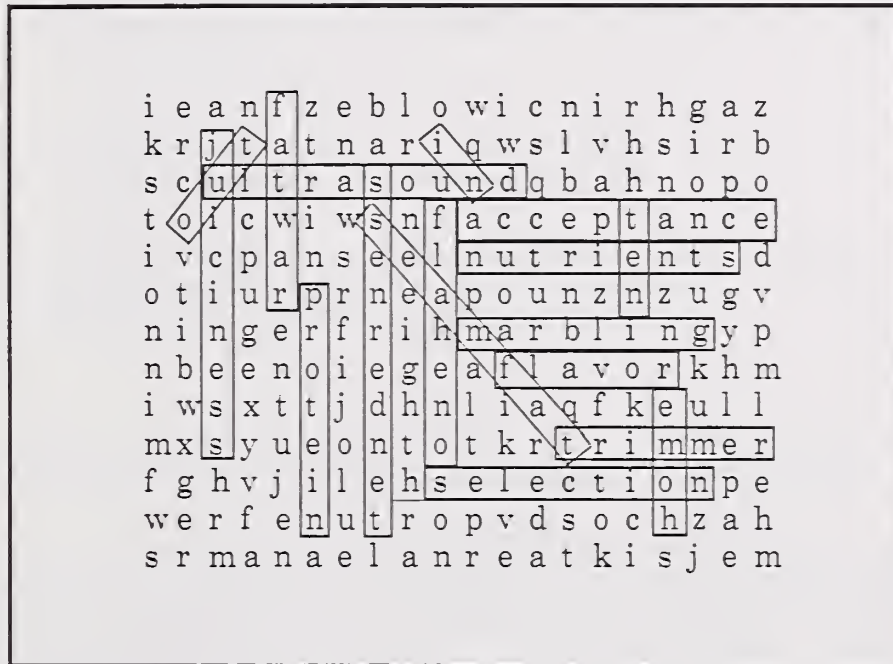
Livestock started to become leaner in the 1950s, not because of consumer pressure, but because ranchers and feedlot operators found it was more efficient and economical for cattle, sheep and hogs to gain a pound of lean than a pound of fat. Recently, livestock producers have come to the realization that they are in the food business, not solely the livestock production business. This has caused a new surge in the leanness of livestock produced. Ranchers are using ultrasound, an instrument used in human medicine, to identify the fatness and muscling characteristics of their livestock. Cattle, sheep and hog feeders are looking at new management techniques to produce a lean, high-quality product.

Lean Meat Seek and Find

Find key words from these sentences about lean meat in the word puzzle below and circle them. They may be horizontal, vertical or diagonal.

1. Consumer **acceptance** is a problem with very low fat meat products.
2. Lean meat is a healthful source of **protein** and other important **nutrients**.
3. Fat within a muscle is called **marbling**.
4. Fat between muscles is called **seam fat**.
5. Elements of eating quality include **tenderness**, **juiciness** and **flavor**.
6. Livestock today are **trimmer** than their 1950s counterparts.
7. Fat on retail cuts is trimmed not only at the grocery store but also at **home**.
8. The National Market Basket Survey found that the average amount of external fat on beef retail cuts is **one-eighth** inch.
9. The 1950s version of the USDA Handbook 8 series used cuts of meat with up to **one-half** inch of external fat to develop nutritional profiles of meats.
10. As a result of the National Consumer Retail Beef Study, retailers are involved in a **fat war** in an effort to provide the trimmest beef to the consumer.
11. Fat is eliminated at the producer level by **selection** of leaner replacements.
12. A medical technique used as a new tool to aid the producer in choosing breeding animals is **ultrasound**.
13. "Lean" meat defined by the USDA contains less than **ten** percent fat.
14. Fat is **out** and lean is **in**.

i e a n f z e b l o w i c n i r h g a z
k r j t a t n a r i q w s l v h s i r b
s c u l t r a s o u n d q b a h n o p o
t o i c w i w s n f a c c e p t a n c e
i v c p a n s e e l n u t r i e n t s d
o t i u r p r n e a p o u n z n z u g v
n i n g e r f r i h m a r b l i n g y p
n b e e n o i e g e a f l a v o r k h m
i w s x t t j d h n l i a q f k e u l l
m x s y u e o n t o t k r t r i m m e r
f g h v j i l e h s e l e c t i o n p e
w e r f e n u t r o p v d s o c h z a h
s r m a n a e l a n r e a t k i s j e m



Myths About Lean Meat

MYTH: Beef, pork and lamb contain more cholesterol than chicken.

FACT: Three ounces of trimmed, cooked lean beef, pork and lamb contain 76, 79 and 78mg of cholesterol, respectively, while skin-off, roasted, lean chicken has 76mg of cholesterol.

MYTH: Beef, pork and lamb will not fit into a low calorie diet.

FACT: All three will fit into a low calorie diet. Average 3-ounce servings of cooked beef, pork and lamb lean have 189, 198 and 176 calories, respectively. A 3-ounce serving of any of the meat products supply only 8 to 12 percent of the calories in a 2,000 calorie diet.

MYTH: Diets recommended by health organizations do not include beef, pork or lamb.

FACT: The American Heart Association and the National Academy of Science stated, "Cutting down on saturated fatty acids and cholesterol does not mean cutting out pork, lamb and beef. It simply means being more selective, taking the time to find leaner cuts and asking your meat manager at your grocery store to trim as much fat away as possible." A 3-ounce serving of cooked, lean beef, pork or lamb supplies calories, fat, saturated fatty acids and cholesterol in amounts far below the limits recommended by scientists and health organizations.

MYTH: Beef cattle and sheep graze on valuable land that could be used for the production of crops for humans.

FACT: Of the 2.2 billion acres of land in the United States, about one billion acres are used for pasture and grazing. The vast majority of the land is too rugged, arid, wet or high to cultivate crops of any kind. If it were not for grazing ruminants (animals with four stomachs) such as cattle and sheep, this one billion acres of land would have no productive food use. Cattle and sheep convert otherwise unusable grass and shrubs into nutritious meat.

MYTH: The level of fat on and in beef, pork and lamb cuts has not changed in the last 10 years.

FACT: Results from the National Beef, Pork and Lamb Market Basket Surveys indicate that meat cuts across the United States are leaner than those retail cuts found in grocery store meat cases in the early 1980s. For example, the average outside fat cover on beef cuts is 1/8 inch today, while before 1986 the average fat cover on beef cuts was believed to be 1/2 inch.

MYTH: The livestock producer is not doing anything to make meat leaner.

FACT: Many livestock producers are examining the genetic makeup of their herds and flocks to determine those animals that are superior in leanness. Some are using ultrasound, an instrument often used in human medicine, to identify the muscularity and leanness of cattle, sheep and hogs.

MYTH: Beef, pork and lamb retail cuts are too fat to meet the United States Department of Agriculture definition of "lean meat" (a meat product with less than 10 percent fat).

FACT: Many cuts of beef, lamb and pork fit into the "lean meat" category. If you eat only the lean portion, the average meat cuts in the retail meat case will range in percentage fat from 1.5 to 11 percent. The key is to eat the lean and stay away from the fat. Trim all fat cover and seam fat (fat between muscles) before cooking. The cuts from the round (ham or leg) and loin tend to be the most lean cuts.

MYTH: You must have some fat on the outside of the meat cut to have good tasting beef, pork and lamb.

FACT: It is the fat on the inside of the muscle (marbling) that counts when it comes to the taste appeal of beef, pork and lamb. A review of 50 research studies indicates that retail cuts generally cooked using dry heat methods (broiled, grilled, fried and roasted) require a minimum of 3 percent fat inside the lean to assure acceptable taste appeal. Steaks with less than 3 percent fat tend to be more variable in tenderness, juiciness and flavor.

Suggested Learning Experiences

1. Use a panel of experts to discuss the move toward leanness in the livestock industry and to answer audience questions. The panel may include one or more of the following:

- Livestock producer
- Livestock feeder
- Meat packer
- Retail meat market manager or store manager
- Beef, pork or lamb industry council representative

Have each panel member speak (5 minutes) on his/her area of expertise and give his/her insights into the lean beef movement. Then open the meeting to a question and answer period.

2. Obtain a traditional wholesale meat cut with up to 1 inch fat cover and a trimmer wholesale cut. Separate each cut into lean and fat to demonstrate why more pressure is being placed on the packer and producer to participate in the move toward leanness in the livestock industry.
3. Use the following demonstration to discuss the production of lean meat. This demonstration serves as an excellent review of the principles discussed in this section.

Materials Required

- Three oranges, one with a thin peel, one with a thick peel and one orange that is unripe (or use a grapefruit). The peel will represent fat cover in this demonstration.
- Aluminum foil
- Pennies (30)
- Food weight scale
- Plates
- Table
- Poster board or chalkboard

Demonstration Preparation

Take the orange with the thickest peel and place it and 20 pennies on a sheet of aluminum foil. Wrap the foil completely around the orange and pennies.

Prepare the other two oranges in a similar fashion using only 5 pennies.

Demonstration

Producer

Weigh each orange and write the weight on the poster board. Place the three wrapped oranges on a table in front of the group. Have a few audience members come forward and ask them to guess which orange is the best. Assure them that their answer is as good as anyone's. Point out that:

- a. Identifying lean livestock is also difficult; therefore, technology similar to ultrasound is helping livestock producers select leaner cattle, sheep and hogs.
- b. The weight of the cut is not necessarily the best way to choose the orange.

Packer

Separate the aluminum foil and pennies from the orange and weigh each orange again without the foil and pennies.

Discuss how weight could be due to fat and other items removed during the slaughter process.

Have a few people from the audience evaluate the oranges for leanness and ask them to give reasons as to why they evaluated them as they did. Point out the following:

- a. The thickness of the peel.
- b. That packers traditionally shipped wholesale meat cuts with up to 1 inch of outside fat, giving the retailer the responsibility of trimming off the fat.
- c. That the ripe orange with the thin peel could be compared to the ideal carcass—high eating quality and less fat cover.
- d. That the unripe orange is less desirable because of possible taste appeal problems.

Retailer

Peel each orange and weigh the "meat" portion and determine the percent fat cover (peel) on the orange by dividing the weight of the peeled orange (meat portion) by the weight of the unpeeled orange. Point out that the retailer must also trim fat meat cuts before offering them to the consumer.

Divide each orange into sections, ask several people from the audience to taste each orange and rank them from best to worst, according to taste. Mention that the eating quality of the meat product is another important consideration and, therefore, leanness is not the only selection criterion.

Supplementary Resource Materials

For more information about the move toward leanness in the livestock industry, contact any of the organizations below for the most up-to-date information and educational materials available. The following materials are examples of what is currently available in this area:

American Sheep Industry Association
6911 S. Yosemite, Englewood, CO 80112

- Lean Lamb Marketing (video, 12 minutes)
Shows the changes that are going on in the lamb industry to produce a leaner product for consumers.

National Cattlemen's Association
P.O. Box 3469, Englewood, CO 80155

- The Story of Modern Beef Handbook, 1987
- A Report Card on Beef (video, 8:30 minutes)
"Grades" the beef industry for the decades of the 1970s, 1980s and 1990s in terms of the product it is providing for consumers.
- Today's Trimmer Beef (video, 6 minutes)
Details the results of the checkoff-funded Market Basket Survey which shows that retail beef cuts are now trimmed more closely. This video is ideal for showing food retailers, health professionals and other "influencers" how lean beef has become.

National Live Stock and Meat Board
444 North Michigan Avenue, Chicago, IL 60611

- Nutrient Values of Muscle Foods
- Announcing Some Findings on Cholesterol (brochure)
- A Change of Plate Dietary Kit
- Pork and Consumer Market
- Red Meat: Nutrient Composition and Actual Consumption (slides and script)
- National Consumer Retail Beef Study (video)
- National Market Basket Survey (video)
- A Change of Plate Chart and Food Models
- Exploring Meat and Health
- Announcing Some New Findings on Cholesterol
- Contribution of Red Meat to the U.S. Diet
- Dietitians Quiz on Pork
- Facts about Beef

Evaluation Instrument

Use the evaluation instrument as a pre- and post-test for participants. See copy in handout samples.

Assessment of the concepts learned through participating in Unit 1 can be accomplished by use of the evaluation instrument. At the first meeting, ask participants to complete the evaluation. Keep the results until the completion of the series.

In approximately 6 weeks, ask volunteers on your planning committee to take a representative sample of names on the registration list. Call and ask the participants the questions on the evaluation instrument. This will provide data concerning what participants have learned and retained about Unit 1.

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Unit 2. Meat Safety and Wholesomeness

Contents

	Page
Objectives	17
Concepts	17
Background Information	18
• Why are Pharmacological Agents Used?	18
• Use of Hormones in Livestock Production	18
• Use of Antibiotics in Livestock Production	19
• Pesticides	20
• Lines of Defense in Keeping Meat Safe	21
• The Last Line of Defense in Keeping Meat Safe	22
• The Biggest Safety Foe: Bacteriological Contamination	22
• Conclusion	22
Leader Lesson Plan	23
• Advance Preparation Guide	23
• Presentation Guide	23
Handouts	25
• Evaluation Instrument	
• Hormones and Meat	
• Estrogen Production in Humans and Estrogen Content of Foods	
• Lines of Defense in Keeping Meat Safe	
• Myths About Food Safety	
Suggested Learning Experiences	26
Supplementary Resource Material	27
Evaluation Instrument	28
References	29

Unit 2. Meat Safety and Wholesomeness

Objectives

After completion of Unit 2, participants will be able to:

- 1 Identify the many steps involved in assuring that the meat consumers eat is safe and wholesome.
- 2 List the government agencies involved in monitoring and inspecting the safety and wholesomeness of meat.
- 3 Explain why ranchers and feeders use antibiotics and hormones in livestock production.
- 4 Understand that the proper use of pharmacological agents during livestock production has no proven health risks to humans.
- 5 Understand that the biggest safety risk that meat poses to consumers is illness resulting from bacterial contamination of meat.

Concepts

- 1 Some consumers, nutritionists and health professionals are unaware of the safety check points in place to assure that safe meat products enter the human food chain.
- 2 There are several government agencies involved in testing, monitoring and inspecting meat products.
- 3 Animal drugs must undergo the same scrutiny as human drugs for safety.
- 4 Livestock producers use pharmacological agents to ensure that cattle, sheep and hogs maintain good health and grow efficiently and quickly.
- 5 Livestock producers are required by law to make sure that drugs given to an animal are either eliminated from the body or at safe levels in the animal's system (as determined by the Food and Drug Administration and the Environmental Protection Agency).
- 6 Livestock producers often use the Livestock Antibiotic Swab Test to determine if antibiotics are present in an animal's body before shipping the animal to market.
- 7 Livestock producers are aware that they will lose the public's confidence if drug violations are found in their livestock when they reach the market place; therefore, most producers police themselves.
- 8 Bacterial contamination is a much more serious health concern than chemical residue in meat products.
- 9 Hormones, properly administered to livestock, are not a human health hazard.

Background Information

Often it is said that the United States has the safest food supply in the world. Is meat as safe as they say? What does the government do to ensure safe food? Are the pharmacological agents used in livestock production safe? This unit will address these and other questions consumers raise concerning the safety of food.

In 1905 Upton Sinclair's book *The Jungle*, with its description of poor sanitary conditions in the meat packing industry, aroused a storm of public apprehension and protest. In response to this, the Federal Meat Inspection Act was passed in 1906 requiring inspection of livestock and carcasses. In addition, processed meat, as well as meat equipment and facilities, required inspection. This act was later updated in 1967 to include livestock targeted for intrastate as well as interstate commerce.

The most recent food safety concern in the minds of consumers is the possibility of chemical residues in meat products purchased for human consumption. Of greatest concern are hormones, antibiotics and environmental contaminants, specifically pesticide residues, finding their way into the human food supply.

Why Are Pharmacological Agents Used?

Livestock can become sick for many of the same reasons as humans, such as changes in the weather or a response to stressful situations. To counteract these health problems, pharmacological agents have been used to prevent illness, shorten the recovery period and, in some cases, to save the animal's life. These therapeutic levels of antibiotics and other drugs usually are administered for a limited period of time (less than 3 weeks) and are followed by a legally required period of time (2 to 9 weeks) sufficient for the elimination of these agents from the animal's system before shipment to the packing plant.

The time required for the drug to be totally eliminated from the animal's system is determined by thorough research and then set by the Food and Drug Administration. Producers who fail to follow these regulations face a fine and jail term for each animal found in violation. A

study done by the Economic Research Service stated that failure to use drugs during critical periods of an animal's life could result in a \$5 billion increase in the cost of food production, mainly due to death loss and decreased performance of cattle, sheep and hogs in the feedlot.

Use of Hormones in Livestock Production

"Growth" implants are used in livestock to increase growth rates of muscle tissue and subsequently decrease the rate of fat deposition in the animal, which ultimately benefits the consumer. Additionally, the administration of these hormones allows livestock to be raised more efficiently, requiring fewer pounds of feed per pound of animal weight gain.

There are five hormones approved by the Food and Drug Administration for use in livestock in the United States—estradiol, testosterone, progesterone, trenbolone acetate (acts like testosterone) and zeranol (acts like estradiol). The first three are naturally occurring and produced daily in livestock as well as in humans, and the last two are synthetic hormones. These hormones are administered by placing an implant under the skin in the base of the animal's ear because the ears are removed at slaughter and not offered for human consumption. The implant is about the size of the end of a sharp pencil.

The use of hormones in livestock has come increasingly into question by the public. The 1989 European Economic Community ban on U.S. imported beef from cattle given hormones has brought this concern into the spotlight in many people's minds. What will happen if meat is eaten from animals that have received one of these implants?

To understand why meat from implanted animals is safe, we must first realize that the human body produces many hormones naturally, every day. Table 1 shows the estrogen, progesterone and testosterone production in humans on a daily basis. A nanogram is one billionth of a gram, which might be visualized as one blade of grass in three football fields.

By contrast, the amount of hormones ingested from eating beef is minuscule when compared to the total amount of hormones produced by the human body daily. For example, if we compare the nanograms of estrogen produced by the human body daily with the estrogen content found in 3 ounces of beef and other foods, we see that the estrogen content in meat is insignificant (Table 2). When considering Table 2, it is important to note that only about 10 percent of the hormone ingested is reported to be actually absorbed by the body. Under Food and Drug Administration regulations, the amount of residues in meat from livestock treated with naturally occurring hormones cannot exceed 1 percent of the average amount of hormone produced by a person in the most sensitive segments of the human population. For instance, a healthy pre-pubertal boy who produces 41,500 nanograms of estrogen each day, assuming 10 percent of the estrogen ingested is absorbed, would have to consume more than 2,180 3-ounce servings of beef per day to equal the FDA's one percent limit. The two synthetic hormones, not produced by

Table 1. Daily human estrogen production (ng).

Classification	Amount (ng) ^b
Girls before puberty	
Estrogen ^a	54,000
Progesterone	250,000
Testosterone	32,000
Boys before puberty	
Estrogen ^a	41,500
Progesterone	150,000
Testosterone	65,000
Non-pregnant woman	
Estrogen ^a	192,000 to 1,192,000
Progesterone	420,000 to 19,600,000
Testosterone	240,000
Pregnant woman	
Estrogen ^a	4,000,000 to 64,300,000
Progesterone	294,000
Testosterone	Not Available
Normal adult male	
Estrogen ^a	136,000
Progesterone	410,000
Testosterone	6,400,000

^a Presented as the summed production of estradiol-17 β and estradiol per 24-hour period.

^b A nanogram is one billionth of a gram.

Source: Hoffmann and Evers, 1986

Table 2. Estrogen levels in a serving of beef and other foods (ng).

Food	Estrogen (ng)
Beef from non-implanted steer, 3 ounces	1.3
Beef from implanted steer, 3 ounces	1.9
Milk, 8 fluid ounces	34.0
Cabbage, 4 ounces	2,700.0
Wheat germ, 1 ounce	567.4
Soybean oil, 1 tablespoon	28,370.0

Source: Booth et al., 1960; and Verdeal and Ryan, 1979

humans, underwent more stringent testing before their use was allowed by the FDA. Zeranol and trenbolone acetate were required to undergo toxicological testing to determine acceptable, safe levels in meat. The tissue residue tolerance levels for meat from cattle are 50 parts per billion for trenbolone acetate and 20 parts per billion for zeranol. The USDA routinely monitors beef for zeranol (currently used much more frequently in livestock production than trenbolone acetate). Since 1986, no tissue samples from livestock have been found to contain zeranol residues.

In 1980, the European Economic Community appointed a commission (called the Laming Committee) consisting of 22 European scientists from 10 countries. The committee concluded that the application of natural hormones in livestock posed no danger to human health. The Codex Alimentarius Commission (CAC), consisting of 11 scientists from seven countries, published a report in 1987 that discussed the safety of the five hormones. They also reported that these hormones when used properly posed no threat to human health. It appears from the findings of these commissions and the testing done by the FDA that the "hormone scare" and the 1989 European Economic Community ban are not based on scientific facts.

Use of Antibiotics in Livestock Production

Subtherapeutic levels of antibiotics may be used in livestock feeds to enhance feed efficiency and improve weight gain. This represents the most controversial use of antibiotics

in animal agriculture. It is termed subtherapeutic because antibiotic levels fed to livestock are lower than those levels normally administered for disease treatment (therapeutic). It has been expressed that the frequent feeding of subtherapeutic levels of antibiotics also used in human health care (such as penicillin and tetracycline) might diminish each drug's effectiveness in treating human bacterial diseases. While the scientific community is divided as to whether this practice is actually a human health concern, it should be pointed out that the livestock industry does not feed penicillin (it is not approved as a feed additive) and has, for the most part, discontinued feeding tetracycline. A 1986 Texas Cattle Feeder's Association Survey reported that out of 102 cattle feedlots producing 11 million head of cattle per year, none were feeding subtherapeutic levels of antibiotics.

Subtherapeutic levels of antibiotics are fed in the swine industry, but swine producers stop feeding antibiotics before the animals go to market and refrain from shipping them to market until the antibiotics in the animals' systems are either totally eliminated from or at safe levels in the animals' bodies. Although the use of antibiotics at subtherapeutic levels is on the decline, the livestock industry routinely uses antibiotics to combat diseases in animals (therapeutic levels). Those animals treated with antibiotics are not permitted to be marketed until the antibiotic residue has been eliminated from the animal. Producers follow the withdrawal time listed on the label of the antibiotic container before allowing the animal to enter the food chain.

Some insecticides are used to rid livestock of external and internal pests (much like the fly sprays used by humans). Again, the producer is required by law to hold all animals the allotted withdrawal period, determined by FDA and listed on the label, before marketing those animals. The Food and Drug Administration reviews and conducts research on animal as well as human pharmacological agents, examining the implications of their use, dosage levels and withdrawal times. Misuse of medicines can be costly. FDA fines start at \$10,000 and violators can be sent to prison. In 1988, the USDA began an extensive antibiotic and sulfa residue detection program at the packing house level. USDA inspectors take urine from livestock and organ tissue samples from carcasses to determine if antibiotics and sulfa residues are present in the animals. Recently

tests have been developed to look for the presence of antibiotics and sulfa residues in livestock on the farm. The tests involve using a urine sample from the suspect animal. Many producers are using the test to ensure that cattle, hogs and sheep have no antibiotic residues prior to slaughter.

Pesticides

Pesticides are of great concern to consumers, but according to a recent report by the American Council on Science and Health, these chemicals pose little risk to human health. Although most pesticides are used on crops and lawns, some part of grain pesticide residues eaten by livestock can get into the meat supply. However, these levels are far below those deemed safe by the Food and Drug Administration and by the World Health Organization. Often, consumers have the idea that the small amounts of residues an animal might consume go directly into the steak or chop they purchase and take home. In actuality, pesticides ingested by the animal are more likely found in fat and organ tissues until they are excreted in the urine and feces.

In 1987 the Food and Drug Administration (FDA) tested 15,000 food samples for pesticide residues and found that less than 0.1 percent of the samples had pesticide levels above the safety tolerance standards set by the World Health Organization. Not one meat cut was found to violate the safety tolerance level set by the World Health Organization. Additionally, in the 1987 FDA Total Diet Study, government personnel purchased foods from supermarkets and analyzed those foods for pesticides. Results showed that pesticides residues were well below daily intake safety levels found acceptable by the World Health Organization.

Why are pesticides used? Pesticides are used to increase the amount of food produced in the world. Last year, pests destroyed one-third of the world's food crops. Pesticides also lower the cost of agricultural production and of foods at the grocery store. Even with pesticide use in the U.S., \$20 billion worth of food is eaten by pests each year, resulting in substantial economical loss for American farmers, which ultimately increases food prices. Farmers are not the only group using pesticides; 13 percent of all pesticides are used to keep homes and gardens pest free.

These are the benefits of pesticide use, but who assesses the risk of pesticide use in the United States? The Environmental Protection Agency regulates the manufacture, use and labeling of pesticides. Also, this federal governmental agency is responsible for monitoring the presence of pesticides in the environment. Before a pesticide is allowed to be sold by a chemical company, it must first undergo research studies to ensure that it will not pose an unreasonable risk to people or the environment. These studies are mandated by the Federal Insecticide, Fungicide and Rodenticide Acts. Another Act of Congress, the Federal Food and Drug and Cosmetic Act, requires that these studies also determine the safe food tolerance levels before release of the chemical for commercial use. The "food tolerance" residue levels allowed by federal law are often 100 to 1,000 times lower than the level that causes "no harmful" effects in test animals.

Safety tolerance levels are set on the assumption that those chemicals would be safe at their tolerance levels if people were exposed to the pesticide every day for a lifetime. A chemical's safety tolerance level is based on current scientific evidence, but as new research is conducted the tolerance level is reassessed. The Food and Drug Administration and the United States Department of Agriculture's Food Safety and Inspection Service are responsible for monitoring residues in food.

Dr. Bruce Ames, Chairman of the Department of Biochemistry at the University of California at Berkeley, stated in an American Council on Science and Health report, that the dose (amount consumed) makes the chemical safe or unsafe. For instance, 96 cups of coffee would be the toxic dose of caffeine. As mentioned above, several FDA studies report that pesticide residue levels in meat are well below their maximum safety tolerance levels permitted by law. Dr. Ames also reported that natural toxins in plants are being consumed at 10,000 times higher levels than man-made toxins.

Lines of Defense in Keeping Meat Safe

Assuring safety of the meat supply begins at the ranch or farm. Livestock owners have the most to lose if meat from their animals is found

unsafe for consumption, not only because of the fines and jail terms, but also from a public opinion standpoint. Safety violations potentially could lead to decreased meat consumption. Therefore, farmers and ranchers take their responsibilities seriously when administering pharmacological agents. As mentioned earlier, many producers are utilizing diagnostic tests to determine if antibiotics have been eliminated from the animal before marketing. Additionally, several of the major livestock associations are offering a program that will assist farmers, ranchers and feeders in verifying that they have used pharmacological agents properly and allowed the proper withdrawal time before shipping livestock to market.

The next line of defense is in the hands of two federal agencies, the Food and Drug Administration (FDA) and the Environmental Protection Agency (EPA). Both help test the safety of new drugs before allowing them on the market. No drug may be legally used in the United States unless it is approved by the FDA for either human or animal use. This keeps unsafe drugs out of the market place. In addition to examining the pharmacological agent for safety, the FDA also determines the proper dosage and the time required for the drug to be eliminated from or reach safe levels in the animal. Both the FDA and EPA weigh the risks and benefits of each pharmacological agent or chemical before it is approved. The FDA and EPA, at the request of the USDA Food Safety and Inspection Service, also investigate the misuse of pharmacological agents in the market place. The EPA is involved in monitoring pesticide regulation, storage and handling.

The third line of defense is found at the packing plant. The USDA Food Safety and Inspection Service (FSIS) is responsible for ensuring that the American food supply is safe and wholesome. Cattle, hogs and sheep are examined before, during and after the slaughter process for healthfulness by an FSIS inspector. If wholesomeness is questioned at any time, the inspector will retain the carcass for further testing. Live animals that appear ill are tagged as suspect and their carcasses are more closely examined for signs of disease and drug residues. All carcasses are visually inspected for wholesomeness during the slaughter process. Inspectors view organs and lymph nodes and other tissues for abnormalities. If a carcass is found to be unsafe, it is condemned and placed in a separate area until it can be

properly disposed. FSIS also randomly monitors 50,000 carcasses for more than 100 different compounds. If misuse is found, the carcass is traced back to the source of the error. Besides legal action against the producer, future animals marketed from the establishment where the misuse or error occur are closely monitored until the problem is completely corrected.

The Last Line of Defense in Keeping Meat Safe

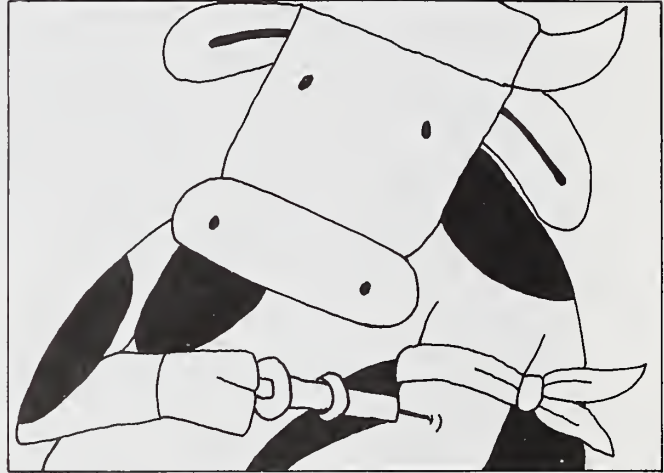
The meat industry is highly regulated to maintain a safe, wholesome meat supply; but what if an illegal residue does find its way through the safeguards mentioned above and into the food chain? Fortunately, the human body has the ability to destroy and eliminate toxins that enter the body. Residues become harmful if taken in very high, concentrated doses or if the body is constantly in contact with residues at levels above those generally considered safe.

The Biggest Safety Foe: Bacteriological Contamination

The biggest threat to the safety and wholesomeness of meat is bacterial contamination. More than 5 million cases of food-borne illnesses are reported yearly. Of the food-borne microbial disease outbreaks reported to the Center for Disease Control during a 5-year period, 77 percent were traced to food service establishments, 20 percent to homes and 3 percent to food processing plants. Illnesses can be caused by poor sanitation, allowing the product to be stored at a higher than recommended temperature (28° to 40° F), cooking to a lower than recommended temperature, storing a product too long before its consumption and poor worker hygiene. Proper handling would eliminate the majority of food-borne illnesses. Proper meat handling practices are discussed in Module III "The Preparation of Today's Lean Meat."

Conclusion

As you have seen from this information, governmental agencies work closely with meat processors and livestock producers to ensure a safe and wholesome meat supply. To further ensure the safety of meat products, consumers must follow recommended food safety and sanitation practices when preparing meat to prevent contamination by bacteria.



Leader Lesson Plan

Advance Preparation Guide

1. Review Unit 2 background information, leader's guide and lesson plans.
2. Review the handouts: "Hormones and Meat," "Myths About Food Safety," "Lines of Defense in Keeping Meat Safe," "Estrogen Production in Humans and Estrogen Content of Foods."
3. Make an appropriate number of copies of the handouts and the evaluation instrument.
4. Examine popular press magazines and news papers for pertinent articles to use as attention getters.
5. Ask federal, state and city health officials, veterinarians, livestock producers and/or packing plant managers to speak or serve on a panel at the meeting.
6. Collect the following materials:
 - a. A cattle growth promoting hormone implant (contact veterinarian)
 - b. A bottle of oral or injectable antibiotic with label (contact veterinarian)
 - c. A bag of lawn pesticide
 - d. A blade of grass
7. Determine which additional learning experiences you would like to use.
8. Order any supplemental resource materials.
9. Obtain poster boards and markers.

Presentation Guide

Setting the Stage

To get the interest of the audience, ask "un-aided" questions such as:

- Do you believe meat is safe?
- Have you heard of safety concerns other than diet/health issues?

Ask general questions such as these and then have your questions become more specific. For instance:

- Have you heard that livestock producers use hormones and antibiotics?
- What have you heard about meat inspection?
- What is the biggest food safety problem?

Teaching Steps

As problems are mentioned, ask the crowd to rank them. Then show news articles with headlines on food safety.

PRE-TEST: Pass out the evaluation instrument and allow 5 to 10 minutes for the audience to complete it. (See page 28.)

HANDOUT: Distribute all of the safety related handouts except the "Estrogen Production in Humans and Estrogen Content of Foods" handout to each program participant.

DISCUSS: Lines of Defense in Keeping Meat Safe. On poster board, write down the different lines of defense and discuss each separately.

Livestock Producer

- a. Public opinion problems when safety violations occur, damaging the demand for meat.
- b. Livestock producer's efforts to police himself.
- c. Show the withdrawal time listed on the antibiotic bottle. Explain that this is the time required by law to hold the animal after the last dose before it can go to market and how the FDA, through research, determines the time period.

FDA

- a. FDA examines and approves the potential use of animal drugs.
- b. The same standards are used to evaluate livestock and human drugs.

EPA-FDA

- a. Weighs the risks and benefits of chemicals used in the United States.
- b. Hold up the bag of lawn pesticide, read the cautions and warnings and show where the EPA name is displayed on the bag.

FSIS-USDA

- a. Point to the state and federal inspection seals on the handout and mention that any meat product sold for human consumption must come from a carcass that displayed one of these seals.
- b. Government inspection occurs before slaughter, during slaughter and during processing.
- c. If possible, have city health inspectors discuss their role in ensuring meat safety.

Consumer

- a. If a chemical residue enters the food chain, the human body has the ability to destroy and eliminate it.
- b. Conclude this segment by asking the audience what is the most highly regulated food industry—the meat industry).

DISCUSS: Livestock Practices:

Hormones

- a. Hold up the hormone implant with gloved hand and then ask the audience what it is.
- b. Mention the types of hormones and why they are used.

c. Ask: Are you wondering what would happen if you ate beef from a steer that had been given one of these?

d. If appropriate, discuss the European Economic Community ban on beef from U.S. cattle given hormone implants.

e. Point out that this is a trade issue, not a food safety issue, by discussing the two scientific commissions (including one formed by the EEC) which found that the use of these five hormones posed no human health hazard.

f. On a piece of poster board, show a lunch menu that includes:

- Beef from implanted steer, 3 ounces
- Milk, 8 fluid ounces
- Cabbage, 4 ounces

g. Take a poll of the audience to determine their opinion of which food item will have the most estrogen.

h. Distribute the estrogen handout.

i. Discuss the amount of estrogen produced in the human body daily. Hold up the blade of grass and explain that a nanogram could be visualized as one blade of grass in three football fields.

j. Review the amount of estrogen in foods.

Antibiotics

- a. Talk about subtherapeutic levels of antibiotics and the decline of their use, not because of scientific findings, but because of consumer opinion.
- b. Discuss why ranchers and farmers use therapeutic levels of antibiotics.
- c. Review the drug residue testing programs that the government and the livestock producer use to ensure that drugs have been eliminated from or have reached safe levels in an animal's body.

DISCUSS: Food-borne illness. Conclude by discussing that this should be a bigger consumer concern than chemical residues in meat.

Handouts

- Evaluation Instrument
- Hormones and Meat
- Estrogen Production in Humans and Estrogen Content of Foods
- Lines of Defense in Keeping Meat Safe
- Myths About Food Safety

Evaluation Instrument

Unit 2, Pre-Post Test

Code/Name _____

Telephone _____

- | | | | |
|-----|---|---|---|
| 1. | T | F | Meat normally is inspected for wholesomeness by packing plant employees. |
| 2. | T | F | Feeding low levels of antibiotics to livestock has been proven unsafe to the public. |
| 3. | T | F | A commission of scientists put together by the European Economic Community stated that administering growth promoting hormones to beef cattle is not hazardous to human health. |
| 4. | T | F | Livestock producers would suffer great economic loss if safety violations were to occur as public opinion of meats would be damaged. |
| 5. | T | F | The Food and Drug Administration evaluates livestock drugs using the same standards as human drugs before approval. |
| 6. | T | F | Children produce the hormones estrogen, progesterone and testosterone in their bodies every day. |
| 7. | T | F | A 3-ounce portion of beef from a steer given a growth-promoting estrogen hormone implant has less estrogen than a 4-ounce serving of cabbage. |
| 8. | T | F | Some livestock producers use diagnostic tools to test for the presence of antibiotics in animals before the producer ships the animal to market. |
| 9. | T | F | Governmental officials routinely test hogs for sulfa drugs at the packing plant. |
| 10. | T | F | When a drug is administered to cattle, sheep or hogs, it stays in the animal's body forever. |
| 11. | T | F | The biggest food safety hazard to humans is pesticides in meat. |
| 12. | T | F | Ninety-seven percent of all reported food-borne illnesses originate in food service establishments and homes. |
| 13. | T | F | Most food-borne illness occurs because of poor sanitation and hygiene, improper meat cookery and improper meat storage (too long and/or too high temperature). |
| 14. | T | F | Drugs often are administered to animals for the same reasons as for humans. |
| 15. | T | F | Foods often have pesticide residues above the safety tolerance level set by the Environmental Protection Agency. |



Evaluation Instrument

Key: Unit 2

1. F, Government employees (FSIS) inspect every animal.
2. F, National Academy of Science says subtherapeutic antibiotic use is safe.
3. T
4. T
5. T
6. T
7. T
8. T
9. T
10. F, Livestock eliminate drugs through the urine, fecal material and breathing.
11. F, Pesticides are not a hazard in meats; food-borne bacteria are the biggest hazard.
12. T
13. T
14. T
15. F, In a 1987 Food and Drug Administration survey of U.S. foods, there were no chemicals above tolerance levels found in meat.

Hormones and Meat

Food and Nutrition The Link Between Agriculture and Health

Why are hormones used in the production of food-producing animals? If I eat meat that was treated with hormones will I grow hair on my chest? Is hormone-treated meat safe to eat? The recent ban by the European Economic Community (EEC) on imported hormone-implanted beef has raised some questions as to the safety of consuming meat that comes from implanted livestock. This fact sheet discusses the current status of hormones used in the production of livestock in the U.S.: how they are used in production, how they are regulated and implications for safety of meat as it is prepared and eaten by consumers.

Why Are Hormones Used?

Hormones may be used by livestock producers to increase the rate of weight gain and to improve the efficiency of feed use by the animal.

As a result, livestock gain weight faster on less feed and can be slaughtered sooner, with lower production costs. In addition, hormones reduce the amount of fat in meat, a bonus for consumers. As estimated 70 to 90 percent of feedlot cattle are implanted. Beef and sheep may be implanted. Hormones are not administered to swine.

How are Hormones Administered?

A one-time pelleted implant is injected under the skin on the back side (top) of the ear flap. The implant gradually dissipates over time. Hormones are not given in feed.

Hormones Used

Five hormones are approved for use in the United States: estradiol, testosterone, progesterone, trenbolone acetate and zeranol. The first three are produced naturally by livestock as well as humans. The last two are synthetically made and are not found physiologically in animals or humans.

FDA Approval

The Food and Drug Administration (FDA) has approved the five growth-promoting hormones and concluded that no physiologic effect could be expected in consumers from eating meat of hormone-treated livestock.

Estradiol, testosterone and progesterone are produced throughout the lifetime of every man, woman and child and are required for proper physiologic functioning and maturation of every mammal. Consumers are exposed to rather large quanti-

ties of these hormones throughout their own daily production and to much lesser quantities from non-hormone-treated food-producing animals.

When consumers eat meat from animals that were previously treated with hormones, the increased amount of hormone is very small compared to their own production of hormones.

For example, a 500g (about 1 pound) portion of meat from treated cattle contains about 15,000 times less estradiol than the average daily amount produced by men and several million times less than the amount produced by pregnant women. Therefore, consumers will not be at risk when eating meat from animals treated with estradiol. Similar comparisons apply to testosterone and progesterone.

The human body produces its own hormones, and the FDA has concluded that no effect could be expected in consumers eating meat containing 1 percent or less of the amount they daily produce. The amount used for that calculation is the amount of hormone produced by prepubertal boys and girls. They produce lesser amounts than other population segments; thus, 1 percent of their level would be a smaller amount than 1 percent of the amount of hormones produced by adults.

The safe levels in treated animals are minute amounts:

- 120 parts per trillion (ppt)-estradiol
- 3 parts per billion (ppb)-progesterone
- 600 parts per trillion (ppt)-testosterone

Tests indicate that the levels of additional hormones in meat from treated animals are far below the safe level. Even in situations of misuse, the FDA indicates the levels of hormones left in meat would not reach a concentration considered unsafe.

The **synthetic hormones**, on the other hand, are not produced by humans. Therefore, these hormones required extensive toxicological testing in animals to determine safe levels in meat. The manufacturers also had to demonstrate that amounts of hormone left in meat would be below the safe level. The tissue residue tolerance levels for meat from cattle are:

- 50 parts per billion-trenbolone acetate
- 20 parts per billion-zeranol

Monitoring for Hormone Residues - FSIS

The Food Safety and Inspection Service the U.S. Department of Agriculture conducts the National Residue Program (NRP) to help prevent the marketing of animals containing violative

residues (unacceptable levels) of animal drugs, pesticides and other chemicals. Violations are determined by reference to the tolerance levels set by the FDA, in the case of hormones.

For the naturally-occurring hormones, no monitoring is done. The FDA has concluded that monitoring is not necessary because the increased exposure to the hormones is far below concentrations considered to be safe. Additionally, the analytical methods used would not distinguish between hormones already in the animal and those that might remain from a hormonal implant. Of the synthetic hormones, FSIS monitors zeranol. In addition, the FSIS monitors for diethylstilbestrol (DES), a hormone which is no longer permitted in the U.S. for treating animals. Neither zeranol nor DES residues were found in tissues of livestock sampled in 1986 and 1987.

Scientific Review

The Codex Committee on Residues of Veterinary Drugs in Foods, a committee of 11 scientific experts from 7 countries, met in June, 1987, to evaluate the safety of use of hormones for growth promotion. After review of the five hormones in question, the committee concluded that use of the naturally-occurring hormones was unlikely to pose hazard to human health and that with proper use, neither would the other two hormones.

Similarly, an EEC committee chaired by Professor G.E. Laming of the United Kingdom and including 15 European scientists recently presented findings to the British Veterinary Association. The committee concluded that the use of the hormones as growth promoters in cattle would not cause harm to consumers.

Conclusion

Regulatory agencies in the U.S. have determined that use of growth promoters in livestock does not constitute a health problem for consumers. At least two international scientific panels have agreed. In the meantime, the EEC ban continues and seems to be based on political considerations rather than on scientific evidence of the wholesomeness of the product.

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All educational programs and materials are available without discrimination on the basis of race, color, national origin, sex or handicap.

INDUSTRY



Estrogen Production in Humans and Estrogen Content of Foods

Table 1. Daily human estrogen production.

Classification	Amount (ng) ^b
Girls before puberty	
Estrogen ^a	54,000
Progesterone	250,000
Testosterone	32,000
Boys before puberty	
Estrogen ^a	41,500
Progesterone	150,000
Testosterone	65,000
Non-pregnant woman	
Estrogen ^a	192,000 to 1,192,000
Progesterone	420,000 to 19,600,000
Testosterone	240,000
Pregnant woman	
Estrogen ^a	4,000,000 to 64,300,000
Progesterone	294,000
Testosterone	Not Available
Normal adult male	
Estrogen ^a	136,000
Progesterone	410,000
Testosterone	6,400,000

^aPresented as the summed production of estradiol-17 β and estradiol per 24-hour period.

^bA nanogram is one billionth of a gram.

Source: Hoffman and Evers, 1986

Table 2. Estrogen levels in a serving of beef and other foods.

Food	Estrogen (ng) per serving
Beef from non-implanted steer, 3 ounces	1.3
Beef from implanted steer, 3 ounces	1.9
Milk, 8 fluid ounces	34.0
Cabbage, 4 ounces	2,700.0
Wheat germ, 1 ounce	567.4
Soybean oil, 1 tablespoon	28,370.0

Source: Booth et al., 1960; and Verdeal and Ryan, 1979

INDUSTRY



Ranchers, Farmers and Feeders

The livestock producer has the most to lose, from a public opinion standpoint, when drugs are misused; therefore, producers often police themselves making sure that pharmacological agents are used at the proper time and in the proper amounts. Also, the producer is required by law to hold the animal until the drug has either been eliminated or reduced to safe levels (determined by the Food and Drug Administration) before the animal is shipped to market. Often livestock producers use diagnostic tests to determine when the antibiotics have been eliminated from an animal's system. Also, highly trained veterinarians play an active role in the treatment of livestock.

Food and Drug Administration

Approves the potential use of all human and livestock drugs. Each drug is evaluated for its potential toxicity, proper dosages and the amount of time required for the drugs to reach safe limits in the animal.

Environmental Protection Agency and Food and Drug Administration

Weighs the possible risk and benefit of each drug and other chemicals (such as pesticides) before allowing the drug or chemical on the market. Evaluates the latest research findings on chemicals that have already been approved to re-evaluate their effectiveness and safety. Also, they monitor the proper use of the chemicals in the market place.

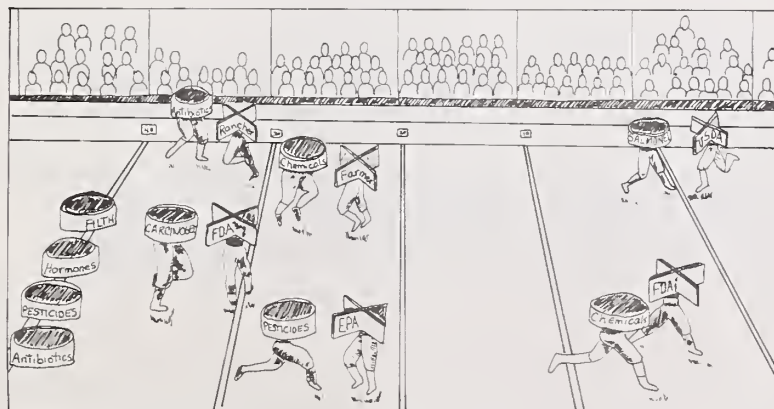
USDA–Food Safety and Inspection Service and Other State and City Health Inspection Services

FSIS inspectors evaluate livestock before slaughter, after slaughter and during processing to ensure that the meat that enters the food chain at the packing and processing plant level is safe and wholesome. Also city and state officials are responsible for enforcing local health ordinances at the retail and food service levels.

Consumer

Even though the meat industry is the second most highly regulated industry in the United States, next to nuclear energy, it is not infallible. In the event that a residue does enter the food chain, the human body has the ability to destroy and eliminate toxins that enter the body. Residues become

harmful if taken in very high, concentrated doses or if the body is in contact with residue levels, above those deemed safe, every day for an extended period of time.



INDUSTRY



MYTH: Meat is processed under unsanitary conditions.

FACT: The meat industry is the most regulated of all food industries. It has been described as the second most regulated industry in the nation, next to nuclear energy. Three governmental agencies—Food Safety and Inspection Service, Food and Drug Administration and Environmental Protection Agency—directly oversee the safety and wholesomeness of meat products. Physical inspection of meat is made by certified inspectors from USDA. Every meat product sold at the retail or food service level must first have been inspected by either a federal or state inspector before it is allowed to enter the food chain.

MYTH: Penicillin and tetracycline are fed indiscriminately to cattle and hogs.

FACT: Penicillin is not approved for use in livestock feeds. Additionally, the Texas Cattle Feeder's Association, whose membership feeds more than 11 million cattle per year (one-third of the yearly U.S. fed beef supply), indicates that no tetracycline is being fed to cattle in their members' feedlots.

MYTH: Livestock cannot eliminate therapeutic levels of drugs from their bodies.

FACT: Most drugs are eliminated from an animal's body in 3 to 30 days after the last dose is administered. The Food and Drug Administration tests the length of time a drug remains in cattle, sheep and hogs. The rancher is not allowed to market his livestock until after the administered drugs have been eliminated from the animal's body—a violator will face \$10,000 in fines and jail.

MYTH: There is no way to check and see if antibiotics and sulfa drugs have been eliminated from the animal's body.

FACT: The Food Safety and Inspection Service routinely tests for over 100 different compounds in meat products, including antibiotics and sulfa drugs. Also, some livestock producers are using diagnostic procedures to ensure that antibiotics and sulfa drugs have been eliminated from their animals' systems before they are sold to the packer.

MYTH: The 1989 European Economic Community ban of U.S. beef from cattle implanted with hormones is appropriate as a food safety basis.

FACT: In 1980 the European Economic Community appointed a commission (called the Lammung Committee) consisting of 22 European scientists from 10 countries. The committee concluded that the application of natural hormones in livestock posed no danger to human health. The Codex Alimentarius Commission (CAC), consisting of 11 scientists from seven countries, published a report in 1987 that discussed the safety of the five hormones. They reported that these hormones used properly posed no threat to human health. It appears from the commission's findings and the testing done by FDA that the "hormone scare" and the 1989 European Economic Community ban are not based on scientific facts.

MYTH: Chemical residues found in meat should be consumers' biggest concern.

FACT: Although consumers' biggest safety concern deals with chemical residues in meat, their real concern should be bacteriological contamination of meat. According to FDA, chemical residues in foods are not a problem, while the Center for Disease Control cites more than 5 million cases of food-borne illnesses yearly. Of the food-borne microbial disease outbreaks reported to the Center for Disease Control over a 5-year period, 77 percent were traced to food service establishments, 20 percent to homes and 3 percent to food processing plants. The majority of these food-borne illnesses are most likely the result of poor sanitation, allowing the product to be stored at a higher than recommended storage temperature (28° to 40° F), storing a product too long before its consumption and/or poor hygiene.

MYTH: Estrogen (estrogenic compounds) is found only in muscle foods.

FACT: A 3-ounce serving of beef from an implanted steer has 1.9 nanograms (ng, approximately 2 billionths of a gram) of estrogen, while a 4-ounce serving of cabbage has 2,700ng. A 3-ounce serving of beef from a non-implanted steer has 1.3ng of estrogen.

Suggested Learning Experiences

Ask one or more of the following to speak or serve on a panel during the program. Give each member of the panel time to explain their job responsibilities and how they work to ensure a safe food supply. Then allow the audience to ask panel members questions.

- Packing plant inspector
- Packing plant manager
- Retail meat manager
- Veterinarian
- City health official
- Rancher or farmer
- Retail consumer affairs representative

Supplementary Resource Material

For more information about the move toward leanness in the livestock industry, contact any of the organizations below for the most up-to-date information and educational materials available. The following materials are examples of what is currently available.

American Council on Science and Health 995 Broadway, New York, NY 10023-5860

- Does Nature Know Best? Natural Carcinogens in American Food
- Big Fears Little Risk (video)
Discusses the use of pesticides

American Meat Institute P.O. Box 3556, Washington, DC 20007

- The U.S. Meat Supply: Your Safety Assured
- What's in the Meat We Eat

Food and Drug Administration Washington, DC 20204

- Food and Drug Administration Pesticide Program (1987)
- Residues in Foods - 1987. J. Assoc. Official Anal. Chem. 71:
Nov/Dec. 1988

Food Safety and Inspection Service **Publications Office** 1165 South Building USDA, Washington, DC 20250

- Meat and Poultry Inspection: FSIS Facts
- The National Residue Avoidance Program: FSIS Facts
- Food Additives: FSIS Facts
- The Safe Food Book—Your Kitchen Guide

Meat Export Federation Cherry Creek Plaza I, Suite 1000 600 South Cherry, Denver, CO 80222-1716

- Hormones in Meat Production,
U.S. Meat Press Information

National Cattlemen's Association P.O. Box 3469, Englewood, CO 80155

- The Story of Modern Beef Handbook, 1987
- Production of Modern Beef (video, 15 minutes)
This videotape explains what "modern beef" is and what it means to individual beef producers. It would be an ideal opening piece for a seminar or discussion on changes in the modern beef business.
- Story of Modern Beef (video, 10 minutes)
This videotape shows what the beef industry has done and is doing to "trim the fat" and make other changes so that beef is a more desirable product among today's modern consumers. The video contains graphic examples of the nutritional value of beef and how the saturated fatty acids in beef is not as bad as has been assumed. The video is informative for consumers and beef producers.
- Producing Wholesome Beef (video, 15 minutes)
This videotape puts the use of growth promoting implants into perspective and shows that the U.S. beef supply is, without a doubt, safe and wholesome. The tape shows that misconceptions about the use and safety of cattle implants are unfounded and that the products are safe.

Evaluation Instrument

Use the evaluation instrument as a pre- and post-test for participants. See copy in handout samples.

Assessment of the concepts learned through participating in Unit 2 can be accomplished by use of the evaluation instrument. At the first meeting, ask participants to complete the evaluation. Keep the results until the completion of the series.

In approximately 6 weeks, ask volunteers on your planning committee to take a representative sample of names on the registration list. Call and ask the participants the questions on the evaluation instrument. This will provide data concerning what participants have learned and retained about Unit 2.

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MODULE II

Meat, Nutrition and Your Health

Coronary heart disease is the leading cause of death in the United States claiming more than a half million lives yearly. Another 5.4 million have been diagnosed as having heart disease while many others are undiagnosed. Cigarette smoking, high blood pressure and high blood cholesterol are the most clearly established risk factors. Total calories, total fat, saturated fatty acids and cholesterol in the diet affect blood cholesterol levels. Other risk factors are obesity, diabetes and physical inactivity. Cancer, the second leading cause of death in the U.S., is responsible for about 20 percent of all deaths. Diet is one of several risk factors contributing to some forms of cancer.

Diet has been identified as a contributing factor in many health problems facing Americans. Overweight persons have a higher death rate and mortality than persons of normal weight. They also tend to be at greater risk of developing hypertension and diabetes. About 24 percent of women and 18 percent of men are more than 20 percent above what is considered healthy weight. In the late 1970s, 42 million adults were affected by blood pressure of 140/90 mm HG (mercury) or greater. By the mid-1980s as many as 58 million were affected. Restricting sodium intake and maintaining healthy weight can reduce blood pressure in many people with hypertension. Other nutrients, such as calcium, also may play a role.

Meat is a major component of the U.S. diet and provides many valuable nutrients. However, meats have been implicated in contributing to the diseases mentioned above because they contain fats which are made up of combinations of saturated, polyunsaturated and monounsaturated fatty acids, cholesterol and in the case of processed meats, relatively large amounts of sodium. Consumers are confused about these fats. Also, many consumers do not recognize appropriate serving sizes, and they lack skills in preparing lean meats lower in fat and calories. These are the reasons why many positive contributions of meats to a well-balanced diet have been overlooked.

Today's lean meat is a result of the meat industry responding to consumers' demand for a leaner product. The purposes of this module, "Meat, Nutrition and Your Health," are to:

- Increase understanding about today's lean meat and its value in a balanced diet of variety and moderation (Unit 1).
- Discuss the link between the fat we eat and our risk of developing coronary artery disease and how today's lean meat fits into a heart-healthy diet (Unit 2).
- Provide insight into whether there is a relationship between sodium and hypertension, sodium levels in lean fresh and processed meats and how these lean meats fit into the diet (Unit 3).

Target Audiences

This lean meat educational program is appropriate for a variety of audiences. Consider your audience both individually and as a group. Are you teaching in a formal or informal situation? How much experience have they had in food shopping, storage, preparation and creative meal planning? Will there be ethnic, income and ability levels to consider? To what extent are dietary problems a consideration? How do eating habits and mode of living affect meal patterns and nutritional aspects? – the right choice for one may be entirely wrong for another. To what extent is time a factor?

Target audiences for Module II

Elderly
Health education teachers
Fitness clubs
Livestock producers
Weight Watchers (personnel and clients)
Parent/Teacher's Organization or Association
Women's/men's service organizations
Professional organizations
Health maintenance organizations
Health professionals
Chiropractors

Activities for Module II

Programs at health fairs
Articles in Weight Watcher's Magazine and Teen Magazine
In-store tours and demonstrations
Programs/exhibits at sporting events
Videos for waiting rooms (i.e., doctor's office, hospitals)
Science projects (local and national)
TV/radio talk shows
Newsletter articles for various health organizations
(more activities in other Modules)

Unit 1. Meat Nutrition—Overview

Contents

	Page
Objectives	4
Concepts	4
Background Information	5
• Eat a Variety of Foods	5
• A Daily Food Guide for Variety and Balance	5
• What Is A Serving?	5
• More On Meat Alternates	7
• Nutritive Value of Meat	7
• Maintaining Healthy Weight	11
• Meat and Weight Control	13
Leader Lesson Plan	14
• Advance Preparation Guide	14
• Presentation Guide	14
Handouts	19
• Evaluate Your Lean Meat Nutrition Knowledge	
• Nutrition and Your Health: Dietary Guidelines for Americans	
• A Daily Food Guide for Variety and Balance	
• What Is a Serving?	
• Guide to 3-Ounce Cooked Serving Sizes	
• Getting Two Servings of Meat in the Daily Diet	
• Table 1. Nutritional Comparisons of Meats and Alternates	
• Table 2. Selected Nutrients Provided by Animal Products	
• Table 3. Healthy Body Weight Ranges For Adults	
• Know Your Eating Habits	
• What Did You Have to Eat Yesterday?	
Suggested Learning Experiences	20
Supplementary Resource Materials	21
Evaluation Instrument	23
References	24

Unit 1. Meat Nutrition—Overview

Objectives

After completion of this lesson, consumers will be able to:

- 1 Describe the nutritional value of lean meat in a healthful, balanced diet, designed to achieve or maintain healthy weight.
- 2 Demonstrate the importance of good nutrition practices by selecting two 3-ounce (cooked) servings of lean meat group foods or equivalents (meat, fish, poultry and meat alternates) daily, controlling serving sizes for meats and other foods to limit total fat consumption.

Concepts

- 1 The body needs over 40 nutrients, and no one food provides all nutrients.
- 2 A nutritionally balanced diet can be obtained by eating appropriate amounts of foods including meat and meat alternates, enriched or whole-grain breads/cereals, fruits/vegetables and milk and other dairy foods.
- 3 Lean meats of the 1990s have a place in a well-balanced diet based on moderation and variety and can be consumed in accordance with the dietary recommendations of health organizations.
- 4 Two 3-ounce servings or equivalents (cooked weight) of meats, fish, poultry or alternates such as dried beans are recommended daily for adults.
- 5 Meats are nutrient-dense providing a high proportion of vitamins, minerals and other nutrients to calories.
Nutrients include:
 - proteins
 - fats
 - minerals
 - vitamins
 - water
- 6 Some 30 percent of people in the United States are overweight.
- 7 Obesity increases risks for various chronic diseases, i.e., heart disease, hypertension, diabetes and some types of cancer.
- 8 An appropriate adult weight is about the same as the weight at age 25, for most people, if weight was normal at age 25.
- 9 Weight gain occurs when calories provided by foods consumed are greater than calories expended in daily activity. Excess calories are stored in the form of fat deposits (triglycerides) thus resulting in weight gain.
- 10 Meat contributes to weight gain if overconsumed because it contains protein and fat, both of which provide energy (calories).
- 11 To lose weight, evaluate the total diet and reduce foods that are consumed in excess or that are not nutrient-dense such as concentrated sweets and/or fats. Switch to lower calorie foods and different preparation methods. Reduce amounts eaten and figure out ways to increase activity.

Background Information

Eat a Variety of Foods

People need over 40 different nutrients to stay healthy. These include vitamins and minerals as well as protein, fat, carbohydrate and water. Nutrients are found in foods. No one food supplies all the essential nutrients in the amounts you need. So it is important to eat several types of foods each day.

Eating a variety of foods can result in:

1. Increasing assurance of adequate nutrient intake
2. Avoiding deficiencies or excesses of single nutrients
3. Ensuring appropriate balance of micronutrients (vitamins and minerals needed in very small amounts)
4. Reducing the likelihood of exposure to possible contaminants in any single food item
5. Increasing eating enjoyment

Obtain variety in the diet by:

- Selecting various foods from the major food groups
- Selecting various foods within groups
- Altering preparation methods and product forms, for example, cooking without added fat; using raw, canned and frozen foods

A Daily Food Guide for Variety and Balance

We have a vast array of food products from which to select. When shopping, planning and preparing meals for yourself and others, use these suggestions for a varied and nutritious diet.

- Choose foods daily from each of the first five major groups on page 6.

- Include different foods from within the groups.
- Have at least the smaller number of servings suggested from each group.
- Limit total amount of food eaten to maintain healthy body weight.
- Reduce fats, sweets and alcoholic beverages in your diet.

What Is a Serving?

The examples listed below will give you an idea of the amounts of food to count as one serving.

• Breads, cereals and other grain products

1 slice of bread; 1/2 hamburger bun or English muffin; a small roll, biscuit or muffin; 3 to 4 small or 2 large crackers; 1/2 cup cooked cereal, rice pasta; or 1 ounce of ready-to-eat breakfast cereal.

• Fruits

A piece of whole fruit such as an apple, banana or orange; a grapefruit half; a melon wedge; 3/4 cup of juice; 1/2 cup berries, or 1/2 cup cooked or canned fruit; or 1/4 cup dried fruit.

• Vegetables

1/2 cup of cooked or chopped raw vegetables or 1 cup of leafy raw vegetables, such as lettuce or spinach.

• Meat, poultry, fish and alternates

Serving sizes will differ. Amounts should total 5 to 7 ounces of lean meat, fish, or poultry a day. A serving of meat the size and thickness of the palm of a woman's hand is about 3 to 5 ounces and a man's, 5 to 7 ounces. Count 1 egg, 1/2 cup cooked dry beans, or 2 tablespoons of peanut butter as 1 ounce of lean meat.

A Daily Food Guide for Variety and Balance

Food Group	Major Dietary Contributions	Suggested Daily Servings
------------	-----------------------------	--------------------------

Breads, cereals and other grain products

- Whole grain
- Enriched

Provide starch, thiamin, riboflavin, niacin and iron. Whole grains also provide fiber, folic acid, magnesium and zinc.

6 to 11 (Include several servings per day of whole-grain products.)



Fruits

- Citrus
- Other fruits

Contribute many nutrients as well as dietary fiber. Citrus fruits, melons and berries are excellent sources of vitamin C. Deep yellow fruits are high in vitamin A. Fruits also add color, flavor, texture and sweetness to the diet.

2 to 4



Vegetables

- Dry beans and peas (legumes)
- Starchy
- Other vegetables

Supply fiber, some starch or protein; also provide many vitamins and minerals.

3 to 5 (Include all types regularly; use dark green leafy vegetables, dry beans and peas several times per week.)



Meat, poultry, fish and alternates
(eggs, dry beans and peas)

Provide protein, niacin, thiamin, vitamins B₆, B₁₂ (animal foods only), iron, phosphorus and zinc.

2 to 3 (Total 5 to 7 ounces lean)



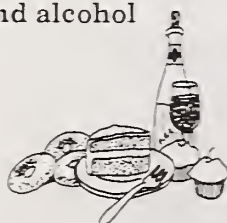
Milk, cheese and yogurt



As the best sources of calcium in U.S. diets, they provide protein, riboflavin, vitamins B₁₂, A, thiamin and if fortified, vitamin D.

2 for adults; 3 for teens and women who are pregnant or breast-feeding; 4 for teens who are pregnant or breast-feeding.

Fats, sweets and alcohol



These foods are calorie-dense, not nutrient-dense. Fats provide 9 calories per gram; sugars, 4 calories per gram and alcohol, 7 calories per gram.

Avoid too many fats and sweets. If you drink alcoholic beverages, do so in moderation.

(Home and Garden Bulletin 232-1, USDA-HNIS, 1986)

- **Milk, cheese and yogurt**

1 cup of milk, 8 ounces of yogurt, 1 1/2 ounces natural cheese, or 2 ounces of processed cheese.

More on Meat Alternates

Eggs can be used as an alternate to lean meat, poultry and fish, but egg yolks are high in cholesterol. The American Heart Association suggests a limit of 4 eggs per week with no limit on the use of egg whites. **Dry beans and peas** and various **nuts and seeds** are also high in protein and can also be used as alternates. However, the protein in these sources is not as high a quality as that found in meats. By combining vegetable proteins appropriately or by adding some animal product such as meat, milk or cheese, protein quality is improved. The vitamin and mineral content of these foods is similar to meat, except they do not contain vitamin B₁₂, which is found only in foods of animal origin. Nuts and seeds are much higher in fat than lean meat.

Cheese is often used in place of meat at meals. But cheese is not a complete nutritional substitute for meat, poultry or fish. It is also high in saturated fatty acids. Both meat and cheese are good sources of protein and vitamin B₁₂.

Although cheese is an excellent source of the mineral calcium, it contains little iron. On the other hand, meat is not a good source of calcium. So, it is necessary to include both milk products and meat or meat alternates in the daily diet.

The equivalents below indicate the amount of meat alternate that can substitute for 1

ounce of lean meat, poultry or fish. They also show the extra fat in nuts and seeds, compared to lean meats.

Nutritive Value of Meat

Nutritional values of 3-ounce cooked servings of lean meats, poultry, fish and meat alternates are found in Table 1. In the food supply, lean meats are a major contributor of vitamin B₁₂, iron, zinc and other nutrients as noted in Table 2.

1. **Proteins** in meats are high quality, providing all essential amino acids in proportions needed for growth and repair of body tissues. Essential amino acids cannot be synthesized by the body and must be supplied in food.

The proteins in meats and other animal foods are different from proteins found in vegetable products. Meats contain higher amounts of the eight essential amino acids.

Animal products contribute just over two-thirds of the protein available in the food supply. Lean meat contributes just over one-fourth of this amount (Table 2).

What dietary proteins do:

- Provide amino acids to maintain body tissues, building and replacing proteins that are regularly broken down.
- Provide amino acids for new proteins needed during growth.

Alternate = Meat, Poultry and Fish

1/2 cup cooked dry beans or peas + 1 teaspoon = 1 ounce lean meat, poultry or fish
fat + 1 slice bread

2 tablespoons peanut butter = 1 ounce lean meat, poultry or fish + 3 teaspoons fat

Food = Equivalent

1/4 cup seeds = 1 ounce lean meat, poultry or fish + 4 teaspoons fat

1/3 cup nuts = 1 ounce lean meat, poultry or fish + 5 teaspoons fat

- Provide energy in the amount of 4 calories per gram.

2. **Fats** are part of a larger group of compounds known as lipids. Most dietary fats occur as triglycerides. Each triglyceride molecule contains three fatty acids. These fatty acids may be saturated, polyunsaturated or monounsaturated.

Palmitic and stearic acids are the major saturated fatty acids found in meats, but saturated fatty acids make up only one-third of the fat in lean meats. Polyunsaturated and monounsaturated fatty acids account for the remaining two-thirds (Table 2). (Refer to Unit 2 of this module for additional information about fatty acids.)

Meats are an important source of fat. On a raw basis, meats account for almost 28 percent of fat available for people to eat (Table 2). Some of that fat, however, is either lost during cooking or cut off and not consumed.

What dietary fats do:

- Provide the most concentrated source of energy: 9 calories per gram. For example, 1 teaspoon of oil provides 40 calories.
- Provide satiety or a feeling of fullness after eating because fats stay in the stomach longer than other nutrients.
- Carry fat-soluble vitamins. Vitamin A is the main one found in lean meats.
- Provide a small amount of the essential polyunsaturated fatty acid, linoleic acid. Fat in lean meats is about 3 percent linoleic acid.
- Contribute to flavor, texture and overall eating quality of foods.

3. Minerals

Iron is an important mineral found in meats. About 50 percent of the iron in meats is heme iron.

Heme iron is more readily absorbed from the gastrointestinal tract into the bloodstream than iron found in plant foods. Iron from cereals and dark-green leafy vegetables is better absorbed if consumed with vitamin C-rich foods or if eaten in the same meal with meat, poultry or fish. Lean meats provide about 23 percent of the iron available in the food supply (Table 2).

Intake of iron is frequently low in the diet of women, and iron deficiency among women is one of the most common dietary deficiencies in the United States today. Adult women typically consume just over half the Recommended Dietary Allowance for iron. This is a problem existing across all age groups and economic levels.

Iron, as a component of hemoglobin, aids transfer of oxygen and carbon dioxide in the blood and is an essential part of red blood cells.

Zinc is an important trace mineral. Lean meats provide about a third of the zinc available in the food supply (Table 2).

Zinc is essential in the make-up or function of some 70 enzymes involved in digestion or metabolism. Zinc aids in synthesis of collagen, the protein that binds cells together, and it is essential for growth because of its role in a variety of bodily reactions. It plays an important role in wound healing, particularly of the skin layers, and zinc enhances the sense of taste. Zinc is a component of the hormone, insulin, and it is necessary for successful sexual maturation.

Phosphorus is a major nutrient important in every cell. Phosphorus is found in all animal foods, including meats. Phosphorus is involved in release of energy from fats, proteins and carbohydrates. It also helps the transport of other nutrients from the intestine to the cells where they are ultimately needed. Phosphorus is

**Table 1. Nutritional comparison of meats and alternates
(3-ounce cooked servings or equivalents).**

Food	Calories	Total fat (g)	Saturated fatty acids (g)	Cholesterol (mg)	Protein (g)	Sodium (mg)	Iron (mg)	Zinc (mg)	Thiamin (mg)	Niacin (mg)	B ₁₂ (mcg)
Beef ¹ (3 oz)	180.0	7.9	3.0	73.0	25.4	56.0	2.5	5.8	.08	3.4	2.3
Pork ¹ (3 oz)	198.0	11.1	3.8	79.0	23.0	59.0	1.1	3.0	.59	4.3	0.7
Lamb ¹ (3 oz)	175.0	8.1	2.9	78.0	24.0	64.0	1.7	4.5	.09	5.4	2.2
Chicken ² (3 oz)	162.0	6.3	1.7	76.0	24.6	73.0	1.0	1.8	.06	7.8	0.3
Cod ³ (3 oz)	89.0	0.7	0.1	47.0	19.4	66.0	0.4	0.5	.07	2.1	0.9
Halibut ⁴ (3 oz)	119.0	2.5	0.4	35.0	22.7	59.0	0.9	0.5	.06	6.1	1.2
Shrimp ⁵ (3 oz)	84.0	0.9	0.2	166.0	17.8	190.0	2.6	1.3	.03	2.2	1.3
Egg ⁶ (3 whole)	225.0	15.0	4.6	639.0	18.7	189.0	2.2	1.7	.09	0.1	1.5
Peanut butter ⁷ (6 tbsp)	564.0	48.0	9.2	0.0	23.6	459.0	1.6	2.4	.13	12.6	0.0
Pinto beans ⁸ (1 1/2 cup)	351.0	1.3	0.3	0.0	20.9	3.0	6.7	2.8	.47	1.0	0.0

¹ Composite of cuts, lean only, cooked

² Flesh only, roasted

³ Atlantic, cooked, dry heat

⁴ Atlantic and Pacific, cooked, dry heat

⁵ Mixed species, cooked, moist heat

⁶ No added fat

⁷ Smooth style

⁸ Cooked, boiled, unsalted

Sources: USDA, Composition of Foods, Agriculture
Handbooks 8-1, 8-5, 8-10, 8-13, 8-15, 8-16.

Table 2. Selected nutrients provided by animal products, 1985 (in percent).

Nutrient	Animal product						Total for all animal products	Total from all foods (per capita/day)
	Milk and milk products	Eggs	Lean meats ^a	Poultry	Fish and shellfish	Animal fats		
Calories	10.0	1.6	15.5	3.5	0.9	4.2	35.6	3,560.0 ^b
Protein	20.9	4.2	27.6	11.2	4.6	0.0	68.5	102.0g
Total fat	11.4	2.3	27.7	4.9	0.7	9.6	56.6	172.0g
Saturated fatty acids	20.5	2.0	32.8	4.0	0.5	14.3	74.2	59.0g
Cholesterol	14.0	40.4	25.8	11.1	3.4	5.3	100.0	480.0mg
Vitamins								
Niacin	1.6	0.1	27.3	14.3	5.3	0.0	48.6	26.0mg
Riboflavin	34.6	4.5	16.3	4.9	1.1	0.1	61.4	2.4mg
Thiamin	8.8	1.4	23.5	1.8	0.6	0.0	36.1	2.2mg
Vitamin A	9.6	1.9	12.5	4.3	0.3	1.9	30.5	9,900.0 IU
Vitamin B ₆	11.0	2.0	25.6	10.3	3.7	0.0	52.8	2.1mg
Vitamin B ₁₂	20.0	6.3	51.5	8.4	12.1	0.0	98.3	8.8mcg
Minerals								
Calcium	76.2	2.2	2.2	0.8	1.2	0.2	82.8	920.0mg
Iron	2.4	4.0	23.1	4.7	1.5	0.0	35.7	18.3mg
Magnesium	20.0	1.3	9.0	3.8	2.1	0.0	36.3	320.0mg
Zinc	19.8	4.1	36.2	8.1	3.3	0.1	71.5	12.3mg

Note: Values are based on disappearance of retail weight without correction for waste or other loss such as nutrient losses during cooking.

^a Lean meat is beef, veal, pork and lamb.

^b This figure may differ slightly from other published sources because of rounding.

Source: Designing Foods: Animal Product Options in the Marketplace, National Research Council, National Academy Press, Washington, 1988.

part of many essential protein compounds and genetic materials needed for cell production. It also serves with calcium to promote calcification of bones and teeth and helps keep body fluids in balance.

Magnesium is another major mineral. Lean meats are an important source. Magnesium is used by the body in bone mineralization, the building of protein, enzyme action, normal muscle contraction, transmission of nerve impulses and maintenance of teeth.

Sodium is found in low amounts in fresh meats; large amounts in processed meats. As a compound of blood and fluid surrounding body cells, it helps keep fluids from leaving blood and going into the cells. It helps counteract acids and keep body neutrality in balance. Sodium is involved in transmission of nerve impulses and contraction of muscles. (See Unit 3 of this module for more information on sodium and meats.)

4. Vitamins

Vitamin A—Meats and liver provide the richest sources of Vitamin A. Lean meats in total provide about 12 percent of the vitamin available in the food supply (Table 2). Vitamin A promotes vision, maintains the cornea and mucous membranes. This fat soluble vitamin promotes growth by affecting 1) development and maintenance of skin and 2) development of bone and teeth. Vitamin A promotes reproduction. It is also important in hormone synthesis and regulation and in the development of immunity.

Thiamin (B₁)—Pork provides more than other meats. Lean meats as a group provide almost one-fourth of the thiamin in the food supply (Table 2). Thiamin helps biochemical reactions needed for the body to use fats and carbohydrates. It also supports normal appetite and nervous system functioning.

Niacin—This B vitamin can also be made from the amino acid trypto-

phan. Both niacin and tryptophan are found in meats. About 27 percent of niacin in the food supply comes from lean meat (Table 2). Niacin helps release energy from carbohydrates, fats and proteins and helps form proteins, fats and other compounds. It also supports health of the skin, the nervous system and the digestive system.

Riboflavin (B₂)—Food supply data show that more riboflavin is provided by milk foods than by lean meats, but lean meats provide about 16 percent of the available riboflavin (Table 2). The vitamin helps biochemical reactions involving carbohydrates, fats and proteins. It also supports normal vision and skin health.

B₆ (pyridoxine)—Lean meats supply one-fourth of this B vitamin (Table 2). B₆ serves in many biochemical reactions involving amino acids and fatty acids but not directly in energy-releasing reactions.

B₁₂ (cobalamin)—This water soluble vitamin is found only in foods of animal origin. Over 50 percent of B₁₂ in the food supply is in lean meats (Table 2). Vitamin B₁₂ is needed for normal growth and takes part in synthesis of new cells. It helps maintain healthy nervous tissue and is needed to utilize folacin, another vitamin. The vitamin also is needed for normal blood formation, aiding in the maturation of red blood cells. A deficiency leads to pernicious anemia, a condition in which red blood cells become large and immature instead of developing into smaller, mature red blood cells.

Maintaining Healthy Weight

Maintaining a healthy weight throughout life is important for long-term health. However, people tend to become more sedentary in adulthood and gain weight. Creeping weight gain can take its toll. Excessive fat is harmful to your health and can shorten your life. It increases the risk of high blood pressure, diabetes, heart disease and certain cancers.

Table 3. Healthy body weight ranges for adults

<u>Height without shoes</u>	<u>Weight in pounds without clothing</u>	
	19 to 34 years	35 years and over
5'0"	97-128	108-138
5'1"	101-132	111-143
5'2"	104-137	115-148
5'3"	107-141	119-152
5'4"	111-146	122-157
5'5"	114-150	126-162
5'6"	118-155	130-167
5'7"	121-160	134-172
5'8"	125-164	138-178
5'9"	129-169	142-183
5'10"	132-174	146-188
5'11"	136-179	151-194
6'0"	140-184	155-199
6'1"	144-187	159-205
6'2"	148-195	164-210
6'3"	152-200	168-216

Note: The weights range across small, medium and large frame sizes. Higher weights in a range generally apply to men, lower weights generally apply to women.

Source: Nutrition and Your Health: Dietary Guidelines for Americans, 3rd Edition, USDA and USDHHS, 1990.

The way excess fat is distributed in the body is associated with health risks. For example, recent research has shown that people who tend to have their fat concentrated in the waist and abdomen (common in males) rather than thighs and buttocks, may be more prone to increased risk of diabetes, hypertension and coronary heart disease.

Weight charts, like the one on page 12, can help individuals assess their weight. Weight above these ranges are believed to be unhealthy for most people. Weights slightly below these ranges may be healthy for some small-boned people.

Some people within the healthy weight range for their height are not fit. Exercise will improve fitness. Many people are both overweight and overfat.

In the United States, nearly 30 percent of the adult population is overweight or too fat. More women than men are overweight. Overweight increases with age. It also is more prevalent among black women than white women. Also, women of lower socioeconomic status are more at risk than are women of higher socioeconomic status.

Meat and Weight Control

Some people believe that eating meat can make you fat. In efforts to lose weight, they may give up eating meat. Meats do contain both protein and fat, nutrients that provide calories. Therefore, like any other food that provides calories, meat will contribute to weight gain if it is overconsumed. Extra calories from any food source can result in weight gain. However, meat provides too many nutrients to be completely left out of your diet.

Shedding extra pounds and keeping weight off is not easy for anyone, but knowing some basic principles will help.

Whether you have 5 pounds to lose or whether you have 20, there is only one way to lose weight. Use up more calories than you take in. This means that you must either select foods containing fewer calories than you normally eat or you must increase your activity—preferably both. Generally, to lose one pound a week, you must either decrease calorie intake by about 500 calories a day or burn up those

500 calories by increasing physical activity. A steady loss of 1/2 or 1 pound a week is about right.

All calories count, regardless of the food origin. But, some foods have more calories than others. For the same weight, the fat in foods and the alcohol content in alcoholic beverages have more calories than carbohydrates and protein:

- Fat provides 9 calories per gram
- Alcohol provides 7 calories per gram
- Carbohydrate provides 4 calories per gram
- Protein provides 4 calories per gram

Proteins, vitamins, minerals, carbohydrates and some fat are all essentials of a good diet, regardless of calorie count. The healthy approach in losing weight is to choose a variety of foods providing the nutrients needed, and to go easy on foods that supply mainly calories. Examples are sugars, sweets, fats and oils, foods that are high in sugars and fats, soft drinks and alcoholic beverages.

Nutrition scientists recommend that everyone choose a diet low in fat, and use sugar and alcohol in moderation. However, when trying to lose weight, it is especially important to decrease intake of foods high in fat, sugar and alcohol. They are often the source of "extra" calories.

To lose weight, look at your eating patterns and habits and review the total diet eaten. Assess what, where, when, why and how much you usually eat. Identify problem habits and their causes. Work on those. Add foods to balance the diet, following the Daily Food Guide for Variety and Balance and reduce foods that provide mostly concentrated energy in the form of fats—salad dressings, fat spreads, gravies, rich desserts and fried foods. Switch to lower calorie foods or alter preparation methods. Reduce amounts eaten and figure out ways to increase activity.

Remember, moderate portions of lean meat foods, prepared with low-fat cooking methods, are a part of your weight-loss diet. They provide significant amounts of nutrients while contributing a modest number of calories. They are also part of a healthy maintenance diet.

Leader Lesson Plan

Objectives

After completion of this lesson, consumers will:

1. Describe the nutritional value of meat in the total diet.
2. Explain the role of meat in a balanced diet, designed to achieve or maintain healthy weight.
3. Demonstrate the importance of good nutrition practices by selecting two 3-ounce (cooked) servings of lean meat group foods (meat, fish, poultry and meat alternates) daily, controlling serving sizes for meats and other foods to limit total fat consumption.

Key Concepts

1. Lean meats fit into a well-balanced diet evaluated against current health-promoting Dietary Guidelines.
2. Lean meats are nutrient-dense, providing many vitamins, minerals and other nutrients relative to the amount of calories they provide.
3. The nutritive value of lean meats in an individual's diet depends on:
 - How the meat is prepared
 - How much is eaten
 - What other foods are eaten in the total diet

Advance Preparation Guide

1. Read Unit 1. Meat Nutrition—Overview background, leader lesson plan and hand-out materials.
2. Complete the activities prior to the meeting to better understand the objectives, subject matter and methods of presenting materials.
3. Review "Nutrition and Your Health—Dietary Guidelines for Americans," Home and Garden Bulletin No. 232, 1990, U.S. Dept. of Agriculture and U.S. Dept. of Health and Human Services, listed on page 21.

4. Reproduce copies of the following handouts in sufficient quantities for the group meeting.

- Evaluate Your Lean Meat Nutrition Knowledge (pre-post test)
- Nutrition and Your Health: Dietary Guidelines for Americans
- A Daily Food Guide for Variety and Balance
- What Is a Serving?
- Guide to 3-Ounce Cooked Serving Sizes
- Getting Two Servings of Meat in the Daily Diet
- Table 1. Nutritional Comparisons of Meats and Alternates
- Table 2. Selected Nutrients Provided by Animal Products
- Table 3. Healthy Body Weight Ranges for Adults
- Know Your Eating Habits
- What Did You Have to Eat Yesterday?

Presentation Guide

PRE-TEST: To get the audience's interest, ask participants to complete "Evaluate Your Lean Meat Nutrition Knowledge."

A. Meat in a Varied Diet

Setting the Stage

HANDOUT: "Nutrition and Your Health: Dietary Guidelines for Americans"

DISCUSS: List the Dietary Guidelines and explain that four of those have a relationship to meat in the diet:

- Eat a variety of foods
- Maintain healthy weight
- Choose a diet low in fat, saturated fat and cholesterol
- Use salt and sodium only in moderation

(This unit will address the first two. Ask what it means to have variety in the diet.)

DISCUSS: The need to "Eat A Variety of Foods" (pp. 5-6).

Have food groups written on board or paper and then have individuals holding slips with dietary contributions or number of servings, and try to match them to the appropriate food group.

HANDOUT: "A Daily Food Guide for Variety and Balance" and discuss the groups, dietary contributions and suggested servings. Ask how we can use this guide when we eat combination foods like tacos, casseroles, pizza, etc.

DISCUSS: Variety in the diet by selecting various foods within groups.

Divide the group into smaller groups of 4 to 5 people. One person will write while the rest of the group brainstorms as many meat and meat alternate food items as they can in one minute. Have each recorder read off the list to the total group. Note the number of different meat foods listed.

SAY: A variety of meat foods were identified and the number of servings suggested is two. How do we know a serving of meat when we see it?

SHOW: Deck of cards or a plastic food model of a 3-ounce serving of meat.

HANDOUT: "Guide to 3-Ounce Cooked Serving Sizes," pictures of 3-ounce meat servings from "A Change of Plate," National Live Stock and Meat Board, 1988.

SAY: • A quarter pound of ground beef patty before it is cooked provides approximately one 3-ounce cooked serving.

- An 8-ounce raw pork chop provides about a 3-ounce serving when cooked, with bone and fat removed.

There are any number of ways to obtain two 3-ounce servings of meat or meat alternates each day.

These servings can be spread throughout the day or, occasionally eaten all at one meal. Meat or meat alternates do not need to be eaten at each meal.

How you actually do obtain the 2- to 3-ounce servings will depend on your personal needs and preferences.

HANDOUT: "Getting Two Servings of Meat in the Daily Diet"
Have groups complete activity.

DISCUSS: Lean meats are nutrient-dense. This means that they provide a high proportion of nutrients to calories. The high nutritional density makes these meats a favored addition to low-calorie diets. Nutrients include proteins, fats, vitamins, minerals and water.

Proteins:

The proteins in meats are high quality, providing all the essential amino acids in the right proportions needed for growth and repair of body tissues. In addition, proteins provide energy in the amount of 4 calories per gram of protein.

Fats:

Dietary fats are part of a larger group of compounds known as lipids. Fats provide the most concentrated form of energy. Each gram of fat supplies 9 calories. Most dietary fats occur as triglycerides. That means they are made up of three fatty acids held together by a compound, glycerol. In addition to providing energy, fats provide the essential fatty acid, linoleic; fats carry fat-soluble vitamins, help us feel full, and add to the pleasure of eating. (Fats, saturated fatty acids and cholesterol are discussed in detail in Unit 2 of this Module.)

Minerals:

Meats provide important minerals like iron and zinc. Iron is essential for transfer of oxygen and carbon dioxide in blood. The iron found in meats, heme iron, is more readily taken up by the blood stream from the gastrointestinal tract than the iron found in grains and vegetables.

Women are especially prone to low iron levels and need to make a special effort to consume iron-rich foods.

Zinc is needed for growth, for healthy skin and is involved in many chemical reactions that help our bodies use the nutrients found in the foods we eat.

Phosphorus and magnesium are important in releasing energy from the proteins, carbohydrates and fats in the foods we eat.

Sodium is found in low amounts in fresh lean meats, higher amounts in processed meats. Sodium is needed to maintain body water balance between various body compartments, such as cells, fluid

surrounding cells and the bloodstream. It also is important for the transmission of nerve impulses and muscle contraction.

Vitamins:

Vitamin A is a fat-soluble vitamin found in meats. Liver is the richest meat source of this nutrient. Vitamin A is important for vision, healthy skin and reproduction.

Several B vitamins are found in meats and are useful in aiding the biochemical reactions that occur in the body. Thiamin, riboflavin and niacin all help release energy from carbohydrates and proteins. Vitamin B₆ aids in the movement of amino acids as they are released from one protein and recombined to form new ones. Vitamin B₁₂ is found only in foods of animal origin. It is needed for normal growth and blood formation.

HANDOUT: Table 1. Nutritional Comparison of Meats and Alternates and Table 2. Selected Nutrients Provided by Animal Products

Point out the nutritional differences among the meats and meat alternates.

Note: The protein equivalents are:

1 egg = 1 ounce of cooked meat
1/2 cup dried beans = 1 ounce of cooked meat
2 tablespoons peanut butter = 1 ounce of cooked meat

The values in the table for the meat alternates all reflect a substitution for 3 ounces of meat to show better the major differences between the meats and the meat alternates. Thus, 3 eggs, 1 and 1/2 cup beans and 6 tablespoons of peanut butter were used.

B. Meat and Maintenance of Healthy Weight

Setting the Stage

DISCUSS: Excess weight in the form of too much fat is a problem today for some 30 percent of the adult population. Excess fat is harmful to your health and may actually shorten your life. It increases risk of high blood pressure, diabetes, heart disease and many other medical problems.

HANDOUT: Table 3. Suggested Body Weight Ranges for Adults

SAY: Weight range charts are designed to help you know if you have a weight problem. But, they do not tell you if extra weight is in the form of muscle or fat.

You may weigh more than the chart shows and still be fit, if your excess weight is in the form of muscle. Overweight is a problem only if extra weight is in the form of fat.

Or, you may be within the weight range and not be fit. If that's you, exercise will help.

Teaching Steps

HANDOUT: "Know Your Eating Habits" and "What Did You Have to Eat Yesterday?"

Check your eating habits using the handouts. These activities will help you recognize patterns so you can decide what and how you want to change.

How did you do?
Did you eat the suggested servings of foods from each of the food groups in the food guide? If you ate more or less from some groups, consider what foods to add and which to reduce for better balance. If you ate the equivalent of two 3-ounce servings of meat, you're right on target, number-wise.

DISCUSS:

Now, consider how meats were prepared. Did you:

- Start with lean meats?
- Trim visible fat before cooking?
- Use dry heat cooking such as roasting, broiling, pan-frying (pouring off fat as the meat cooks)?
- Use water-added cooking methods?
- Drain meat after cooking? Trim off remaining visible fat before eating?
- Chill meat liquid to remove fat that rises and solidifies at the surface?
- Select foods prepared these ways when you ate out?

If you did these things, you are well on your way to eating meat the lower-calorie way. On the other hand, did you:

- Select fatter meats?
- Leave fat on before cooking?
- Fry meats or add gravy to it?
- Use cooked meat in combination dishes without draining?
- Eat the fat left on meat after cooking? Leave fat in meat liquid?
- Order breaded and/or fried meats when you ate out?
- Use high fat sauces?

If you answered yes to some of these, you may want to reconsider how you prepare meats, and make some adjustment to maintain the lower-calorie value of lean meats.

Preparation methods are extremely important in controlling calories. Consider how other foods were prepared and how often fat, sweets and alcoholic beverages were consumed.

Meat has a place in lower calorie weight-loss diets. Once weight is lost, meat continues to have an important role in diets to maintain healthy weight. Some people believe that eating meat can make you fat. Meats do supply both protein and fat, nutrients that provide calories. Therefore, like any other food that provides calories, meat will contribute to weight gain if it is overconsumed. Extra calories from any food source can result in weight gain.

Shedding extra pounds and keeping weight off is not easy for anyone, but knowing some basic principles will help.

- Whether you have 5 pounds to lose or whether you have 20, there's only one way to lose weight, and that is to use more calories than you take in. This means that you must either select foods containing fewer calories than you normally eat, or you must increase your activity or preferably both. Generally, to lose 1 pound a week, you must either decrease calorie intake by about 500 calories a day or burn up those 500 calories by increasing physical activity. (A 3,500 calorie deficit is needed to lose a pound of fat.) A steady loss of 1/2 or 1 pound a week is a healthy goal.

- All calories count—regardless of the food containing them. BUT, some foods have more calories than others. The fat in foods and the alcohol content in alcoholic beverages have more calories than carbohydrates and protein:

- Fat provides 9 calories per gram
- Alcohol provides 7 calories per gram
- Carbohydrate provides 4 calories per gram
- Protein provides 4 calories per gram
- Protein, vitamins, minerals, carbohydrates and fat are essentials of a good diet, regardless of calorie count. The healthy approach in losing weight is to choose a variety of foods providing the nutrients needed, and to go easy on foods that supply mainly calories. Examples are sugars, sweets, fats and oils, foods that are high in sugars and fats, soft drinks and alcoholic beverages.

- Nutrition scientists recommend that everyone choose a diet low in fat, and use sugar and alcohol in moderation. However, when trying to lose weight, it is especially important to decrease intake of foods high in fat, sugar and alcohol. Fats, sugars and alcohol are often the source of "extra" calories.

CONCLUDE: Review PRE-TEST answers with group.

SAY: To lose weight, look at your eating patterns and habits and review your total diet. Identify problem habits and their causes. Work on those. Add foods to balance the diet, reduce foods that provide concentrated energy in the form of fats, salad dressing, fat spreads, gravies, rich desserts and fried foods. Switch to lower-calorie foods or preparation methods. Reduce amounts eaten and figure out ways to increase activity.

Remember, moderate portions of lean meat foods prepared with low-fat cooking methods can contribute to your weight-loss diet as well as to a healthy weight maintenance diet. They provide significant amounts of nutrients with a modest number of calories.

Handouts

- Evaluate Your Lean Meat Nutrition Knowledge
- Nutrition and Your Health: Dietary Guidelines for Americans
- A Daily Food Guide for Variety and Balance
- What Is a Serving?
- Guide to 3-Ounce Cooked Serving Sizes
- Getting Two Servings of Meat in the Daily Diet
- Table 1. Nutritional Comparisons of Meats and Alternates
- Table 2. Selected Nutrients Provided by Animal Products
- Table 3. Healthy Body Weight Ranges for Adults
- Know Your Eating Habits
- What Did You Have to Eat Yesterday?

Evaluate Your Lean Meat Nutrition Knowledge

Circle True or False.

1. T F Meat is a good source of non-heme iron.
2. T F Pork is an excellent source of thiamin.
3. T F The fat in beef is made mostly of saturated fatty acids.
4. T F Fresh lean meats naturally contain low amounts of sodium.
5. T F A well-balanced diet contains foods from these groups: fruits; vegetables; breads and whole grain cereals; meats and meat alternates; milk, cheese and yogurt.
6. T F A 3-ounce serving of cooked ground beef is about the size of a large man's fist.
7. T F All meats and meat alternates contain cholesterol.
8. T F All meats and meat alternates contain vitamin B₁₂.
9. T F Zinc, a mineral found in meat foods, aids in preventing night blindness.
10. T F Americans should consume three 3-ounce servings of meat or meat alternates per day.
11. T F It is necessary to eat meat or meat alternates at every meal to have a well-balanced diet.
12. T F Lean beef, pork or lamb all contain about twice as much dietary cholesterol as chicken.
13. T F You must cut out or greatly reduce meat consumption when dieting to lose weight.
14. T F The most effective way to cut calories is to focus on reducing fat in the diet.
15. T F As long as your weight is in the right range for your height, you can consider yourself in good condition.



Evaluate Your Lean Meat Nutrition Knowledge Key: Unit 1

1. F Cereals and vegetables provide non-heme iron. The iron in meat is heme iron.
2. T Pork provides considerably more thiamin than beef or lamb.
3. F The fat in red meats is made up of all three types of fatty acids: saturated, monounsaturated and polyunsaturated. Saturated fatty acids represent about one-third of the total fat in lean meats.
4. T One serving of fresh lean meat contains less than 100mg of sodium. Processed meats, on the other hand, contain considerable amounts of sodium.
5. T Foods from all of the groups are needed for a balanced diet.
6. F A 3-ounce serving of cooked ground beef is more nearly the size of a woman's fist.
7. F All animal products such as meat, eggs and milk contain cholesterol, but meat alternates such as peanut butter and beans do not.
8. F Vitamin B₁₂ is found in foods of animal origin. Plant-based meat alternates do not contain B₁₂.
9. F Zinc is needed to aid the action of enzymes. It is important for growth and helps wound healing. Vitamin A helps prevent night blindness.
10. F Two 3-ounce servings rather than three are recommended.
11. F It is not necessary to eat meat or meat alternates at every single meal. There are a variety of ways to balance intake throughout the day.
12. F Lean meats and chicken all contain about the same level of cholesterol (approximately 77mg in a 3-ounce serving).
13. F Lean meats are nutrient-dense, containing many valuable nutrients. They should be included in weight-loss diets in appropriate amounts, trimming fats and using no-calorie-added preparation methods.
14. T Fat, whether visible or invisible, is the most concentrated energy source. Reducing fat intake is the most effective way to decrease calorie intake.
15. F Your weight can be well within the appropriate range for your height, but without exercise, you will be physically unfit.



Nutrition and Your Health: Dietary Guidelines for Americans

- Eat a variety of foods.
- Maintain healthy weight.
- Choose a diet low in fat, saturated fatty acids and cholesterol.
- Choose a diet with plenty of vegetables, fruits and grain products.
- Use sugars only in moderation.
- Use salt and sodium only in moderation.
- If you drink alcoholic beverages, do so in moderation.

A Daily Food Guide for Variety and Balance

Food Group	Major Dietary Contributions	Suggested Daily Servings
Breads, cereals and other grain products <ul style="list-style-type: none"> • Whole grain • Enriched 	Provide starch, thiamin, riboflavin, niacin and iron. Whole grains also provide fiber, folic acid, magnesium and zinc.	6 to 11 (Include several servings per day of whole-grain products.)
Fruits <ul style="list-style-type: none"> • Citrus • Other fruits 	Contribute many nutrients as well as dietary fiber. Citrus fruits, melons and berries are excellent sources of vitamin C. Deep yellow fruits are high in vitamin A. Fruits also add color, flavor, texture and sweetness to the diet.	2 to 4
Vegetables <ul style="list-style-type: none"> • Dry beans and peas (legumes) • Starchy • Other vegetables 	Supply fiber, some starch or protein; also provide many vitamins and minerals.	3 to 5 (Include all types regularly; use dark green leafy vegetables, dry beans and peas several times per week.)
Meat, poultry, fish and alternates (eggs, dry beans and peas)	Provide protein, niacin, thiamin, vitamins B ₆ , B ₁₂ (animal foods only), iron, phosphorus and zinc.	2 to 3 (Total 5 to 7 ounces lean)
Milk, cheese and yogurt	As the best sources of calcium in U.S. diets, they provide protein, riboflavin, vitamins B ₁₂ , A, thiamin and if fortified, vitamin D.	2 for adults; 3 for teens and women who are pregnant or breast-feeding; 4 for teens who are pregnant or breast-feeding.
Fats, sweets and alcohol	These foods are calorie-dense, not nutrient-dense. Fats provide 9 calories per gram; sugars, 4 calories per gram and alcohol, 7 calories per gram.	Avoid too many fats and sweets. If you drink alcoholic beverages, do so in moderation.

Breads, cereals and other grain products

- Whole grain
- Enriched

Provide starch, thiamin, riboflavin, niacin and iron. Whole grains also provide fiber, folic acid, magnesium and zinc.

6 to 11 (Include several servings per day of whole-grain products.)



Fruits

- Citrus
- Other fruits

Contribute many nutrients as well as dietary fiber. Citrus fruits, melons and berries are excellent sources of vitamin C. Deep yellow fruits are high in vitamin A. Fruits also add color, flavor, texture and sweetness to the diet.

2 to 4



Vegetables

- Dry beans and peas (legumes)
- Starchy
- Other vegetables

Supply fiber, some starch or protein; also provide many vitamins and minerals.

3 to 5 (Include all types regularly; use dark green leafy vegetables, dry beans and peas several times per week.)



Meat, poultry, fish and alternates
(eggs, dry beans and peas)

Provide protein, niacin, thiamin, vitamins B₆, B₁₂ (animal foods only), iron, phosphorus and zinc.

2 to 3 (Total 5 to 7 ounces lean)



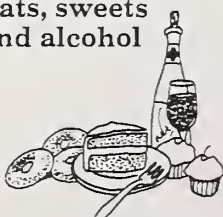
Milk, cheese and yogurt



As the best sources of calcium in U.S. diets, they provide protein, riboflavin, vitamins B₁₂, A, thiamin and if fortified, vitamin D.

2 for adults; 3 for teens and women who are pregnant or breast-feeding; 4 for teens who are pregnant or breast-feeding.

Fats, sweets and alcohol



These foods are calorie-dense, not nutrient-dense. Fats provide 9 calories per gram; sugars, 4 calories per gram and alcohol, 7 calories per gram.

Avoid too many fats and sweets. If you drink alcoholic beverages, do so in moderation.

What Is a Serving?

The examples listed below will give you an idea of the amounts of food to count as one serving.

- **Breads, cereals and other grain products**

1 slice of bread; 1/2 hamburger bun or English muffin; a small roll, biscuit or muffin; 3 to 4 small or 2 large crackers; 1/2 cup cooked cereal, rice or pasta; or 1 ounce of ready-to-eat breakfast cereal.

- **Fruits**

A piece of whole fruit such as an apple, banana, orange; a grapefruit half; a melon wedge; 3/4 cup of juice; 1/2 cup berries, or 1/2 cup cooked or canned fruit; or 1/4 cup dried fruit.

- **Vegetables**

1/2 cup of cooked or chopped raw vegetables or 1 cup of leafy raw vegetables, such as lettuce or spinach.

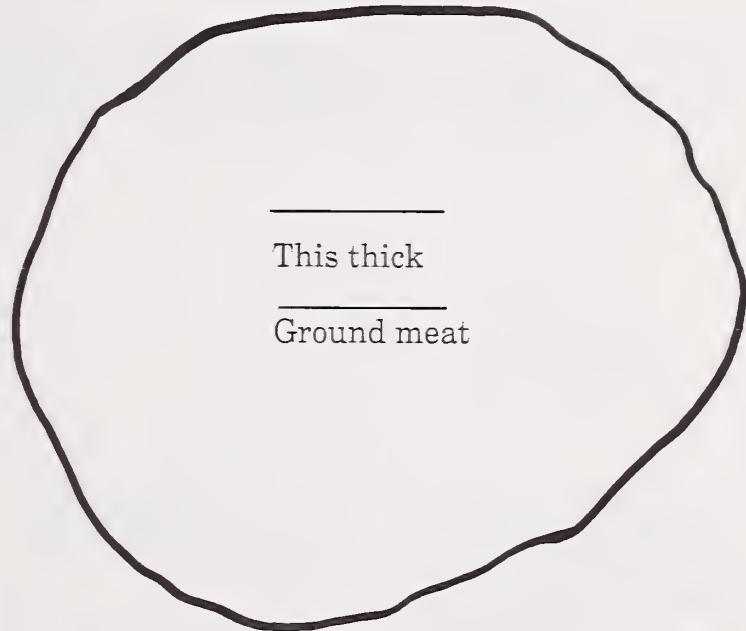
- **Meat, poultry, fish and alternates**

Serving sizes will differ. Amounts should total about 6 ounces of lean meat, fish or poultry a day. A serving of meat the size and thickness of the palm of a woman's hand is about 3 to 5 ounces and a man's, 5 to 7 ounces. Count 1 egg, 1/2 cup cooked dry beans, or 2 tablespoons of peanut butter as 1 ounce of lean meat (protein equivalent).

- **Milk, cheese and yogurt**

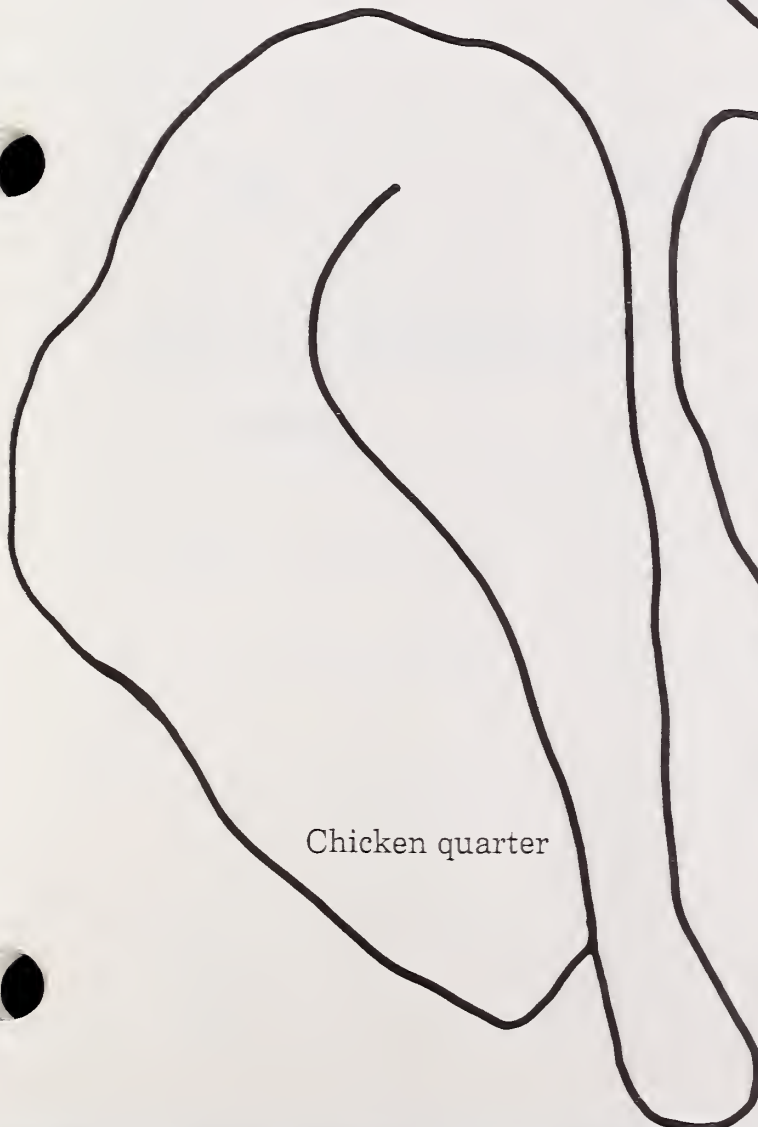
1 cup of milk, 8 ounces of yogurt, 1 1/2 ounces natural cheese or 2 ounces of processed cheese.

Guide to 3-Ounce Cooked Serving Sizes

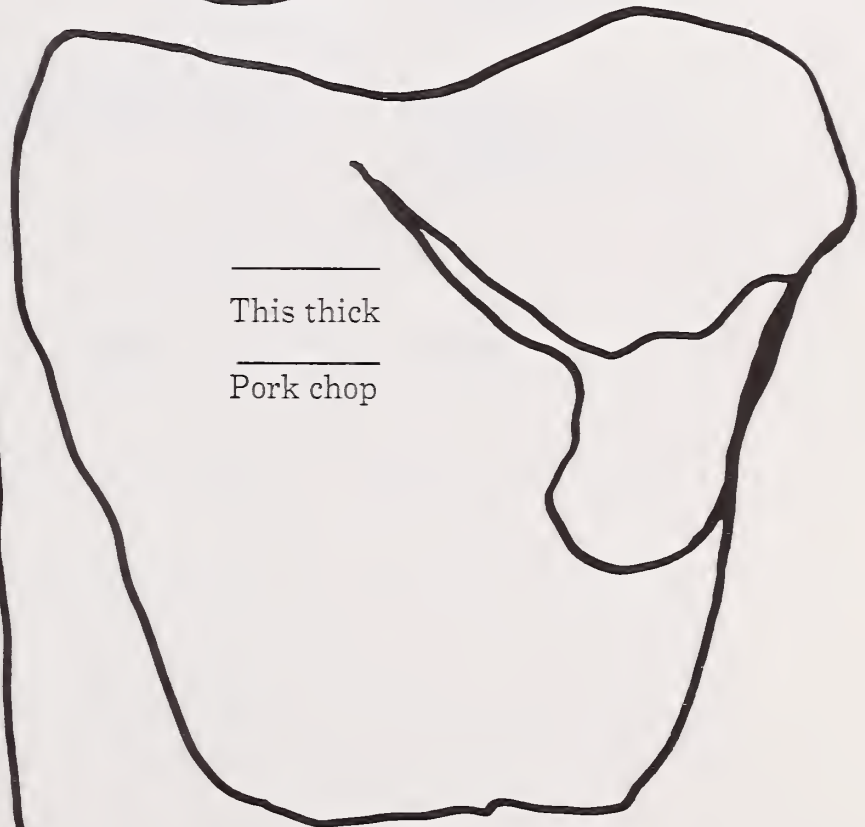


This thick

Ground meat



Chicken quarter



This thick

Pork chop



Getting Two Servings of Meat in the Daily Diet

There are many ways to include two servings of meat and meat alternates in your daily diet plan. Some examples are given. In your small group, determine other meat dishes, meats or meat alternates to obtain the equivalent of two 3-ounce servings of meat. List them in the space provided below the examples.

Examples:

Breakfast	Lunch	Dinner
1.		6-ounce cooked sirloin steak
2.	3 ounces turkey on sandwich	3-ounce cooked pork chop (3 ounces lean meat remains after cooking and trimming fat and bone)
3. 1 egg	1/2 cup navy beans in soup	2 meat tacos, each containing 2 ounces of ground meat

Now, try to write your menu items below:

Breakfast	Lunch	Dinner
1. _____	_____	_____
2. _____	_____	_____
3. _____	_____	_____

**Table 1. Nutritional comparison of meats and alternates
(3-ounce cooked servings or equivalents).**

LEAN MEAT
The Consumer's Choice

Food	Calories	Total fat (g)	Saturated fatty acids (g)	Cholesterol (mg)	Protein (g)	Sodium (mg)	Iron (mg)	Zinc (mg)	Thiamin (mg)	Niacin (mg)	B ₁₂ (mcg)
Beef ¹ (3 oz)	180.0	7.9	3.0	73.0	25.4	56.0	2.5	5.8	.08	3.4	2.3
Pork ¹ (3 oz)	198.0	11.1	3.8	79.0	23.0	59.0	1.1	3.0	.59	4.3	0.7
Lamb ¹ (3 oz)	175.0	8.1	2.9	78.0	24.0	64.0	1.7	4.5	.09	5.4	2.2
Chicken ² (3 oz)	162.0	6.3	1.7	76.0	24.6	73.0	1.0	1.8	.06	7.8	0.3
Cod ³ (3 oz)	89.0	0.7	0.1	47.0	19.4	66.0	0.4	0.5	.07	2.1	0.9
Halibut ⁴ (3 oz)	119.0	2.5	0.4	35.0	22.7	59.0	0.9	0.5	.06	6.1	1.2
Shrimp ⁵ (3 oz)	84.0	0.9	0.2	166.0	17.8	190.0	2.6	1.3	.03	2.2	1.3
Egg ⁶ (3 whole)	225.0	15.0	4.6	639.0	18.7	189.0	2.2	1.7	.09	0.1	1.5
Peanut butter ⁷ (6 tbsp)	564.0	48.0	9.2	0.0	23.6	459.0	1.6	2.4	.13	12.6	0.0
Pinto beans ⁸ (1 1/2 cup)	351.0	1.3	0.3	0.0	20.9	3.0	6.7	2.8	.47	1.0	0.0

¹ Composite of cuts, lean only, cooked

² Flesh only, roasted

³ Atlantic, cooked, dry heat

⁴ Atlantic and Pacific, cooked, dry heat

⁵ Mixed species, cooked, moist heat

⁶ No added fat

⁷ Smooth style

⁸ Cooked, boiled, unsalted

Sources: USDA, Composition of Foods, Agriculture
Handbooks 8-1, 8-5, 8-10, 8-13, 8-15, 8-16.

Table 2. Selected nutrients provided by animal products, 1985 (in percent)



Nutrient	Animal product					Total for all animal products	Total from all foods (per capita/day)
	Milk and milk products	Eggs	Lean meats ^a	Poultry	Fish and shellfish	Animal fats	
Calories	10.0	1.6	15.5	3.5	0.9	4.2	3,560.0 ^b
Protein	20.9	4.2	27.6	11.2	4.6	0.0	102.0 g
Total fat	11.4	2.3	27.7	4.9	0.7	9.6	172.0 g
Saturated fatty acids	20.5	2.0	32.8	4.0	0.5	14.3	59.0 g
Cholesterol	14.0	40.4	25.8	11.1	3.4	5.3	480.0 mg
Vitamins							
Niacin	1.6	0.1	27.3	14.3	5.3	0.0	26.0 mg
Riboflavin	34.6	4.5	16.3	4.9	1.1	0.1	2.4 mg
Thiamin	8.8	1.4	23.5	1.8	0.6	0.0	2.2 mg
Vitamin A	9.6	1.9	12.5	4.3	0.3	1.9	9,900.0 IU
Vitamin B ₆	11.0	2.0	25.6	10.3	3.7	0.0	2.1 mg
Vitamin B ₁₂	20.0	6.3	51.5	8.4	12.1	0.0	8.8 mcg
Minerals							
Calcium	76.2	2.2	2.2	0.8	1.2	0.2	920.0 mg
Iron	2.4	4.0	23.1	4.7	1.5	0.0	18.3 mg
Magnesium	20.0	1.3	9.0	3.8	2.1	0.0	320.0 mg
Zinc	19.8	4.1	36.2	8.1	3.3	0.1	12.3 mg

Note: Values are based on disappearance of retail weight without correction for waste or other loss such as nutrient losses during cooking.

^a Red meat is beef, veal, pork and lamb.

^b This figure may differ slightly from other published sources because of rounding.

Source: Designing Foods: Animal Product Options in the Marketplace, National Research Council, National Academy Press, Washington, 1988.

Table 3. Healthy body weight ranges for adults

<u>Height without shoes</u>	<u>Weight in pounds without clothing</u>	
	19 to 34 years	35 years and over
5'0"	97-128	108-138
5'1"	101-132	111-143
5'2"	104-137	115-148
5'3"	107-141	119-152
5'4"	111-146	122-157
5'5"	114-150	126-162
5'6"	118-155	130-167
5'7"	121-160	134-172
5'8"	125-164	138-178
5'9"	129-169	142-183
5'10"	132-174	146-188
5'11"	136-179	151-194
6'0"	140-184	155-199
6'1"	144-187	159-205
6'2"	148-195	164-210
6'3"	152-200	168-216

Note: The weights range across small, medium and large frame sizes. Higher weights in a range generally apply to men, lower weights generally apply to women.

Source: Nutrition and Your Health: Dietary Guidelines for Americans, 3rd Edition, USDA and USDHHS, 1990.



Know Your Eating Habits

Think about your eating patterns and habits. What, how much, when, where and why do you eat? For each of these questions, check the answers that best describe your eating patterns and habits.

What do I usually eat?

- ☐ A varied and balanced diet that includes only moderate amounts of fat, sugar and alcoholic beverages
- ☐ Deep-fat fried and breaded foods
- ☐ "Extras," such as salad dressings, "pre-dressed" salad bar foods, potato toppings, bread spreads, sauces and gravies
- ☐ Sweets and rich desserts such as candies, cakes and pies
- ☐ Snack foods high in fat and sodium, such as chips and other "munchies"
- ☐ Cocktails, wine and beer

How much do I usually eat?

- ☐ A single small serving
- ☐ Two servings or more
- ☐ Two trips through a buffet

When do I usually eat?

- ☐ At mealtime only
- ☐ While preparing meals or clearing the table
- ☐ While watching TV or participating in other activities
- ☐ At coffee break
- ☐ Before bedtime
- ☐ Anytime

Where do I usually eat?

- ☐ At the kitchen or dining room table
- ☐ At restaurants or fast food places
- ☐ In front of the TV or while reading
- ☐ Wherever I happen to be when I'm "hungry"
- ☐ In the coffee-break room at work
- ☐ In the car between stops
- ☐ Standing up

Why do I usually eat?

- ☐ It is time to eat
- ☐ I am "starved"
- ☐ Foods look tempting
- ☐ Everyone else is eating
- ☐ Food will get thrown away if I don't eat it
- ☐ I am bored or frustrated
- ☐ I am tired
- ☐ I am happy

Look at the lines you checked for "what" and "how much" you eat. Do they provide any clues to where the extra calories are hidden in foods? Your answers to "when, where and why" you eat are important, too. They often affect what and how much you eat.

Can you identify some habits that may be due for a change? Try to think of ways to modify "problem" habits. If you often nibble while doing other things, make an effort to plan your meals and snacks ahead of time. For eating at home, make a rule to eat only while sitting at the kitchen or dining room table. If candy bars from the vending machine at your office coffee break are a problem, substitute a low-calorie snack brought from home. If you often eat because you're bored or frustrated, think of other activities to get your mind off food—jog, call a friend, or walk the dog.

What Did You Have to Eat Yesterday?

List all the foods and beverages you ate yesterday.



Time

Food Item

Approximate Amount

Morning meal

A.M. snacks



Noon meal

P.M. snacks



Evening meal

Evening snacks

Circle all the meat and meat alternates. Put a check ✓ by all foods that had fat toppings, dressings or were fried.

How many *times* did you eat meat or meat alternates?

How many meat food *servings* did you eat?

How many foods had *added* fat toppings, dressings or were fried?

List ways that you might change your eating patterns to have a healthier, better-balanced diet.

Suggested Learning Experiences

1. Use food models or pictures of foods. Ask a couple of participants to make selections for a well-balanced meal with appropriate servings of meat or meat alternates. Ask them to explain their selections to the group. Is the meal balanced? Have others suggest how they would balance this meal with other eating occasions during the day.
2. Collect boxes for frozen meat entrees. What are the serving sizes? If one of these is consumed at a meal, what other meat or meat alternates might be eaten during the day to obtain the equivalent of two 3-ounce servings? What nutrients are listed on the label? Compare these with nutritive values of 3-ounce servings of meats in Table 1.
3. Have several packages of fresh meat available, such as, 1 pound ground beef, a package of pork chops, 1 pound round steak or lamb chops. Have group estimate the number of cooked, 3-ounce servings from each package; for example, 1 pound of ground beef yields four 3-ounce cooked servings.
 - One 8-ounce pork chop yields one 3-ounce cooked serving of lean (bone and trimmable fat removed).
 - One pound round steak yields four 3-ounce cooked servings of lean.
 - Two lamb chops yield one 3-ounce cooked serving of lean.
4. Discuss favorite quick meat recipes. If possible, obtain these ahead of time, or ask a few people to bring them to the meeting. Have two or three written on newsprint so everyone can see. Then, ask for suggestions for modifying these favorites to reduce added fat and carbohydrate calories. See how many different ideas come from the group. Check amount of meat per serving. If you get a few recipes ahead of time, run a nutrient analysis to find out how many calories are added from non-meat ingredients.
5. Discuss ways to prepare less tender, lean cuts, such as round steak. Use of a slow cooker is an excellent time-saver as well as a great way to use long, moist cooking which results in a more tender product. Stir-frying also works well for thin slices.

Supplementary Resource Materials

For more information about eating a balanced, healthy diet, order from sources below. In addition, local Cooperative Extension offices, state livestock commodity associations and heart associations may have these and other related materials.

**U.S. Department of Agriculture
Consumer Information Center
Department EE
Pueblo, CO 81009**

- Home and Garden Bulletin No. 232, "Dietary Guidelines for Americans."
- Home and Garden Bulletin No. 232-1, "Dietary Guidelines for Americans: Eat a Variety of Foods."
- Home and Garden Bulletin No. 232-2, "Dietary Guidelines for Americans: Maintain Desirable Weight."
- Home and Garden Bulletin No. 232-3, "Dietary Guidelines for Americans: Avoid Too Much Fat, Saturated Fat, and Cholesterol."
- Home and Garden Bulletin No. 232-4, "Dietary Guidelines for Americans: Eat Foods with Adequate Starch and Fiber."
- Home and Garden Bulletin No. 232-5, "Dietary Guidelines for Americans: Avoid Too Much Sugar."
- Home and Garden Bulletin No. 232-6, "Dietary Guidelines for Americans: Avoid Too Much Sodium."
- Home and Garden Bulletin No. 232-7, "Dietary Guidelines for Americans: If You Drink Alcoholic Beverages, Do So In Moderation."
- Home and Garden Bulletin No. 232-8, "Preparing Foods and Planning Menus Using the Dietary Guidelines."
- Home and Garden Bulletin No. 232-9, "Making Bag Lunches, Snacks and Desserts."
- Home and Garden Bulletin No. 232-10, "Shopping For Food and Making Meals in Minutes Using the Dietary Guidelines."

- Miscellaneous Publication No. 1457, "Dietary Guidelines and Your Diet," Home Economics Teacher's Guide.
- Home and Garden Bulletin No. 232-11, "Eat Better When Eating Out Using the Dietary Guidelines."

**U.S. Department of Health
and Human Services
Public Health Service
Food and Drug Administration
5600 Fishers Lane
Rockville, MD 20857**

- DHHS (PHS) Publication 88-50211, "The Surgeon General's Report on Nutrition and Health," 1988.

**FDA Consumer
HFE-88
Rockville, MD 20857**

- HHS Publication No. (FDA) 87-2220, "Planning a Diet for a Healthy Heart," 1987.

**American Dietetic Association
216 West Jackson Boulevard
Suite 800
Chicago, IL 60606-6995**

- "Low-Fat Living—A Guide to Enjoying a Healthy Diet"
- "Recommendations of Food Choices for Women"

**American Heart Association
7320 Greenville Avenue
Dallas, TX 75231**

- Dining Out—A Guide to Restaurant Dining, No. 50-067-A.
- Recipe for Fat-Controlled Low Cholesterol Meals, No. 50-020-B.

- The American Heart Association Diet—An Eating Plan for Healthy Americans, No. 51-018-B (SA).

American Meat Institute
1700 North Moore Street
Suite 1600
P.O. Box 3556
Washington, DC 22007

OR

American Meat Institute
P.O. Box 3556
Arlington, VA 22209
703/841-2400

- "Fat Facts"
- "What's in the Meat We Eat?"
- "Yellow Pages: Answers to Predictable Questions Consumers Ask About Meat"

National Live Stock and Meat Board
444 North Michigan Avenue
Chicago, IL 60611

- "Meat Nutri/Scan" on iron and zinc
- "A Change of Plate" chart and food models (some restriction on who can obtain)
- "Eat Light with Beef"
- "Light Cooking with Beef"
- "Meat Nutri-Facts" related to Beef, Pork and Lamb
- "Lean and Light Lamb" recipes
- "Low-Calorie Cooking with Lamb"
- "The Weekend Athlete: An Exercise and Diet Guide"
- "Lamb: Today's Value"
- "Beef: A New Look at Its Nutritive Value"
- "Facts About Beef"
- "Real Food Lover's Guide"

Council for Agricultural Science and Technology
137 Lynn Avenue
Ames, IA 50010-7120

- Briggs, G. 1987. The red meat controversy, Science of Food and Agriculture, 5(2).

AUDIOVISUAL

University of Wisconsin
Agricultural Publications
30 North Murray Street
Madison, WI 53706
608/262-3346

- "Meaty Matters: The Nutrient Contribution of Meat to the American Diet" (video, 30 minutes)

Evaluation Instrument

Evaluation of the concepts learned through participating in Unit 1 can be accomplished by use of a pre-post test. At the first meeting, ask participants to complete the brief "Evaluate Your Lean Meat Nutrition Knowledge" test. Keep the results of the test until the completion of series.

In approximately 6 weeks, ask volunteers on your planning committee to take a representative sample of names on the registration list. Then call and ask the participants the test questions again to see if the concepts taught have been retained. This will provide data concerning what participants learned and retained about this unit.

References

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- Hamilton, E.M.N., Whitney, E.N., andSizer, F.E., 1988. *Nutrition Concepts and Controversies*. 4th ed. West Publications Co., St. Paul, MN.
- National Research Council. 1988. *Designing Foods: Animal Product Options in the Marketplace*. National Academy Press, Washington, DC.
- U.S. Department of Agriculture and Department of Health and Human Services. 1990. *Nutrition and Your Health: Dietary Guidelines for Americans*. 3rd ed. Home and Garden Bulletin No. 232, U.S. Government Printing Office, Washington, DC.
- U.S. Department of Agriculture—Human Nutrition Information Service. 1986. *Dietary Guidelines for Americans: Eat a Variety of Foods*. Home and Garden Bulletin No. 232-1, U.S. Government Printing Office, Washington, DC.
- U.S. Department of Agriculture—Human Nutrition Information Service. 1990. *Dietary Guidelines for Americans: Maintain Desirable Weight*. Home and Garden Bulletin No. 232-2, U.S. Government Printing Office, Washington, DC.
- U.S. Department of Agriculture—Human Nutrition Information Service. 1988. *Nation-wide Food Consumption Survey Continuing Survey of Food Intakes by Individuals, CSF II: Women 19-50 years and their Children 1-5 Years, 4 Days*. NFCS, CFS II Report No. 86-3.
- U.S. Department of Agriculture—Science and Education Administration. 1986. *Composition of Foods: Beef Products—Raw, Processed, Prepared*. Agriculture Handbook No. 8-13, U.S. Government Printing Office, Washington, DC.
- U.S. Department of Agriculture—Science and Education Administration. 1971. *Composition of Foods: Dairy and Egg Products—Raw, Processed, Prepared*. Agriculture Handbook No. 8-1, U.S. Government Printing Office, Washington, DC.
- U.S. Department of Agriculture—Science and Education Administration, 1987. *Composition of Foods: Finfish and Shellfish Products—Raw, Processed, Prepared*. Agriculture Handbook No. 8-17, U.S. Government Printing Office, Washington, DC.
- U.S. Department of Agriculture—Science and Education Administration. 1986. *Composition of Foods: Legumes and Legume Products—Raw, Processed, Prepared*. Agriculture Handbook No. 8-16, U.S. Government Printing Office, Washington, DC.
- U.S. Department of Agriculture—Science and Education Administration. 1983. *Composition of Foods: Pork Products—Raw, Processed, Prepared*. Agriculture Handbook No. 8-10, U.S. Government Printing Office, Washington, DC.
- U.S. Department of Agriculture—Science and Education Administration. 1979. *Composition of Foods: Poultry Products—Raw, Processed, Prepared*. Agriculture Handbook No. 8-5, U.S. Government Printing Office, Washington, DC.

Unit 2. Meat Nutrition: Fats and Cholesterol in the Diet

Contents

	Page
Objectives	26
Concepts	27
Background Information	28
• Diet-Health Issues of Fat and Cholesterol	28
• Dietary Cholesterol Levels	28
• Blood Cholesterol Levels	28
• Dietary Recommendations	29
• Fats and Cholesterol in Lean Meats	29
• Dietary Fat Sources	29
• Visible Versus Less-visible Fat	31
• Form of Fat in Lean Retail Cuts	33
• Lipid Transport System	33
• Dietary Cholesterol	33
• Heart-Healthy Dietary Changes	34
• Preparation Methods for Decreasing Dietary Fat and Cholesterol	35
• Dietary Recipe Modifications to Reduce Dietary Fat and Cholesterol	36
Leader Lesson Plan	38
• Advance Preparation Guide	39
• Presentation Guide	39
Handouts	47
• Evaluate Your Fat and Cholesterol Knowledge	
• Fats in the Diet Evaluation	
• Comparison of National Dietary Guidelines of Health Organizations	
• National Dietary Guidelines of Various Health Organizations	
• Test Your Fat and Cholesterol IQ	
• Specific Amounts of Fat, Cholesterol and Sodium in Lean Meats	
• What Foods Contain Cholesterol?	
• Cholesterol Content of Foods	
• Be a Nutrition Whiz—Reduce Fat Content of the Daily Diet	
Suggested Learning Experiences	48
Supplementary Resource Materials	52
Evaluation Instrument	54
References	55

Unit 2. Meat Nutrition: Fats and Cholesterol in the Diet

Objectives

After completion of Unit 2, consumers will be able to:

- 1 Identify the foods that contain high levels of saturated fatty acids and cholesterol in the diet.
- 2 Define a risk factor as a condition that increases the chance that some thing will happen.
- 3 List certain risk factors involved in the development of heart disease (athero-sclerosis).
- 4 Explain the reasons for avoiding too much dietary fat.
- 5 Outline the importance of eating leaner meat products for a heart-healthy diet.
- 6 Describe the effects of different dietary fatty acids on blood cholesterol levels.
- 7 Determine the types and dietary sources of total fats and fatty acids to assist in wise food selection including moderate consumption of lean meats, fish and poultry.
- 8 Demonstrate the importance of good nutrition practices by selecting no more than 6-ounce (cooked) servings of lean-meat-group foods (meat, fish, poultry or meat alternates) daily, controlling serving sizes for meats and other food groups to limit total fat consumption.
- 9 Recognize visible versus less-visible sources of fat in the diet, in processed and unprocessed fresh foods.
- 10 Plan a varied diet while limiting fat and dietary cholesterol.
- 11 Evaluate food sources of fat and dietary cholesterol so that comparisons can be made among different forms of foods.
- 12 Evaluate different cooking methods that help reduce fat in foods.
- 13 Modify recipes to reduce total fat and cholesterol consumption.
- 14 Identify cholesterol as a necessary component in the body.
- 15 Explain that cholesterol is present in two forms: dietary sources and cholesterol made in the body.
- 16 Know blood cholesterol levels.
- 17 Describe why there is a lipid transport system for carrying fats and dietary cholesterol and name the types of lipoproteins.

Concepts

- 1 For some people, certain diets are risk factors for chronic disease.
- 2 High levels of blood cholesterol are associated with a high risk of heart disease.
- 3 Dietary fat sources are in both visible and hidden forms, and both affect total fat consumed during the day.
- 4 Different fatty acids making up dietary fats affect blood levels of cholesterol in different ways.
- 5 Varying the dietary composition of fatty acids may change blood cholesterol levels (polyunsaturated fatty acids tend to decrease blood cholesterol).
- 6 Meats contain dietary cholesterol, as do all animal foods. Foods from plant sources do not contain cholesterol, but they may be high in total fat and/or in saturated fatty acids.
- 7 Cholesterol is a necessary body component. Cholesterol in humans comes from two sources: food in the diet and that made in the body.
- 8 Meats and other foods contain all these fatty acids (saturated, polyunsaturated and monounsaturated), but in different amounts.
- 9 To reduce consumption of fat and cholesterol, select lean cuts, trim visible fat before cooking and cook by methods that do not add fat. Serve lean meats without adding high fat sauces, gravies or condiments and use appropriate serving sizes.

Background Information

Diet-Health Issues of Fats and Cholesterol

Diet has been identified as a risk factor in many health problems facing Americans today. Despite a sharp decline in the death rate (Surgeon General's Report on Nutrition and Health, 1988), coronary heart disease (CHD) still remains the leading cause of deaths in the United States. More than 1.25 million heart attacks occur yearly, two-thirds of which are in men, resulting in more than 500,000 deaths. Illness and death from heart disease cost \$49 billion in direct health care expenditures and lost productivity. Most CHD results from atherosclerosis. Smoking and high blood pressure along with high blood cholesterol are the most clearly established risk factors for CHD. For some people, certain diets are risk factors for chronic disease. Total calories, total fat, saturated fatty acids and dietary cholesterol affect blood cholesterol levels. In fact, diets high in calories, saturated fatty acids and dietary cholesterol can cause blood cholesterol to increase. An increased blood cholesterol level is one of the major risk factors for heart disease. Other risk factors are obesity, diabetes and physical inactivity.

Atherosclerosis is a progressive disease in which fatty materials, mainly cholesterol, are deposited by blood along the walls of the arteries. This build-up narrows the artery passageways resulting in heart attacks and strokes. Research has indicated that the process of atherosclerosis can be slowed by controlling the following risk factors:

1. **Major risk factors that can be changed:**
 - a. Elevated levels of blood cholesterol or triglycerides
 - b. Elevated blood pressure
 - c. Cigarette smoking
2. **Risk factors that cannot be changed:**
 - a. Heredity
 - b. Sex
 - c. Race
 - d. Age
3. **Contributing factors:**
 - a. Lack of exercise
 - b. Overweight/obesity
 - c. Stress
 - d. Diabetes

Looking at statistics, people with high blood cholesterol levels develop atherosclerosis more often than those with normal levels. Persons with atherosclerosis usually have higher blood cholesterol levels than persons without atherosclerosis. Still, research has shown that decreasing saturated fatty acids and dietary cholesterol reduces the risk of atherosclerosis. If you have been instructed to reduce dietary cholesterol, you need to recognize the types of fat, hidden and visible, in foods. You can change your levels of saturated fatty acids and dietary cholesterol by controlling the types of fat you use in food preparation and by selecting the recommended servings from lower fat dairy foods and lean meat group foods.

Dietary Cholesterol Levels

The average American's diet contains between 400 and 600mg of cholesterol daily. Persons with atherosclerosis or with one or more risk factors may be advised by their physician to eat a low-cholesterol, low-fat diet that provides no more than 300mg of cholesterol per day.

Blood Cholesterol Levels

High cholesterol and triglyceride blood levels have been associated with increased prevalence of coronary heart disease. Everyone should know his or her blood cholesterol level. The National Cholesterol Education Program (1988) recommends that cholesterol tests become a routine part of all physical examinations and that all adults know their cholesterol count.

- Under 200 milligrams per deciliter: Desirable level of blood cholesterol.
- 200 to 240 on the second test: Borderline to high blood cholesterol.
- Over 240: High blood cholesterol.

Dietary Recommendations

The public has received dietary guidance for prevention of heart disease from medical, scientific and public policy groups. Their dietary recommendations are aimed at promoting and maintaining optimum health in the general population. The National Cholesterol Education Program (NCEP), the American Heart Association (AHA), and the National Cancer Institute (NCI) recommend similar guidelines for the fat/cholesterol content of the diet. (The following general dietary guidelines from major organizations are compared and contrasted in the handout, "Comparison of National Dietary Guidelines of Health Organizations.")

All sources reviewed recommended reducing dietary fat and avoiding obesity. The U.S. Department of Agriculture/U.S. Department of Health and Human Services (USDA/DHHS) guidelines endorsed by the recent report, "The Surgeon General's Report on Nutrition and Health" (1988) were the broadest, suggesting avoidance of "too much fat, saturated fatty acids and cholesterol." The National Research Council-National Academy of Sciences (NRC-NAS), the American Cancer Society (ACS) and the National Cancer Institute (NCI) advised the reduction of total fat intake to 30 percent or less of total calories; the Recommended Dietary Allowances (RDA) by the Food and Nutrition Board of the NRC-NAS suggest the total fat intake be reduced to no more than 35 percent of dietary intake.

The American Heart Association (AHA) suggests identical and more detailed guidelines for reducing dietary fat intake. They recommend that the caloric intake from fats be reduced to 30 percent (from the current level of about 35 percent). Saturated fatty acids should be reduced to less than 10 percent of total calories (from present intakes of 15 to 17 percent). Polyunsaturated fatty acid intake should be increased to 10 percent and monounsaturated fatty acids up to 15 percent of the total caloric intake for fat. The average dietary cholesterol intake should be no more than 300mg per day. The organizations also recommended that people adjust their caloric intake to achieve and maintain ideal body weight.

The recent report from the U.S. Public Health Service in "The Surgeon General's Report on Nutrition and Health" (1988) stated:

"Reduce consumption of fat (especially saturated fatty acids) and cholesterol. Choose foods relatively low in these substances, such as vegetables, fruits, whole grain breads and cereals, fish, poultry, lean meats and low-fat dairy products. Use preparation methods that add little or no fat." These recommendations agree with those dietary guidelines from USDA, American Heart Association and National Cholesterol Education Program.

Fats and Cholesterol in Lean Meats

The saturated fatty acid and dietary cholesterol contents in lean meats are the main reason health experts have warned consumers to reduce meat in their diet. Fat in foods including lean meats is never all one kind of fatty acid. It combines different amounts of saturated, monounsaturated and polyunsaturated fatty acids. Figure 1 gives a comparison of the percentages of saturated, monounsaturated and polyunsaturated fatty acids in beef, pork, lamb and chicken. No dietary fat source contains 100 percent saturated, monounsaturated or polyunsaturated fatty acids. In the past, all animal fats have been classified as containing mainly "saturated fat" even though they contain slightly more monounsaturated fatty acids than saturated fatty acids.

For meat to fit within the guidelines for various health organizations (refer to handout, "Comparison of National Dietary Guidelines," in the Lesson Plan), fat content needs to be reduced to about 30 percent of total calories with less than 10 percent being saturated fatty acids. Saturated fatty acids are believed to increase blood cholesterol levels.

Dietary Fat Sources

Foods contain fatty acids. Some fatty acids are "saturated" and some are "unsaturated." Public confusion exists about claims and counterclaims of "saturated," "polyunsaturated" and "monounsaturated" fatty acids.

Saturated fatty acids are found chiefly in animal foods such as butter, cream, whole milk, cheeses made from whole milk, marbling in meat and external fat on meats. Saturated fatty acids are also found in vegetable sources such as coconut oil (commonly found in non-dairy coffee creamers, whipped toppings and

Fatty Acid Content of Lean Meats and Chicken

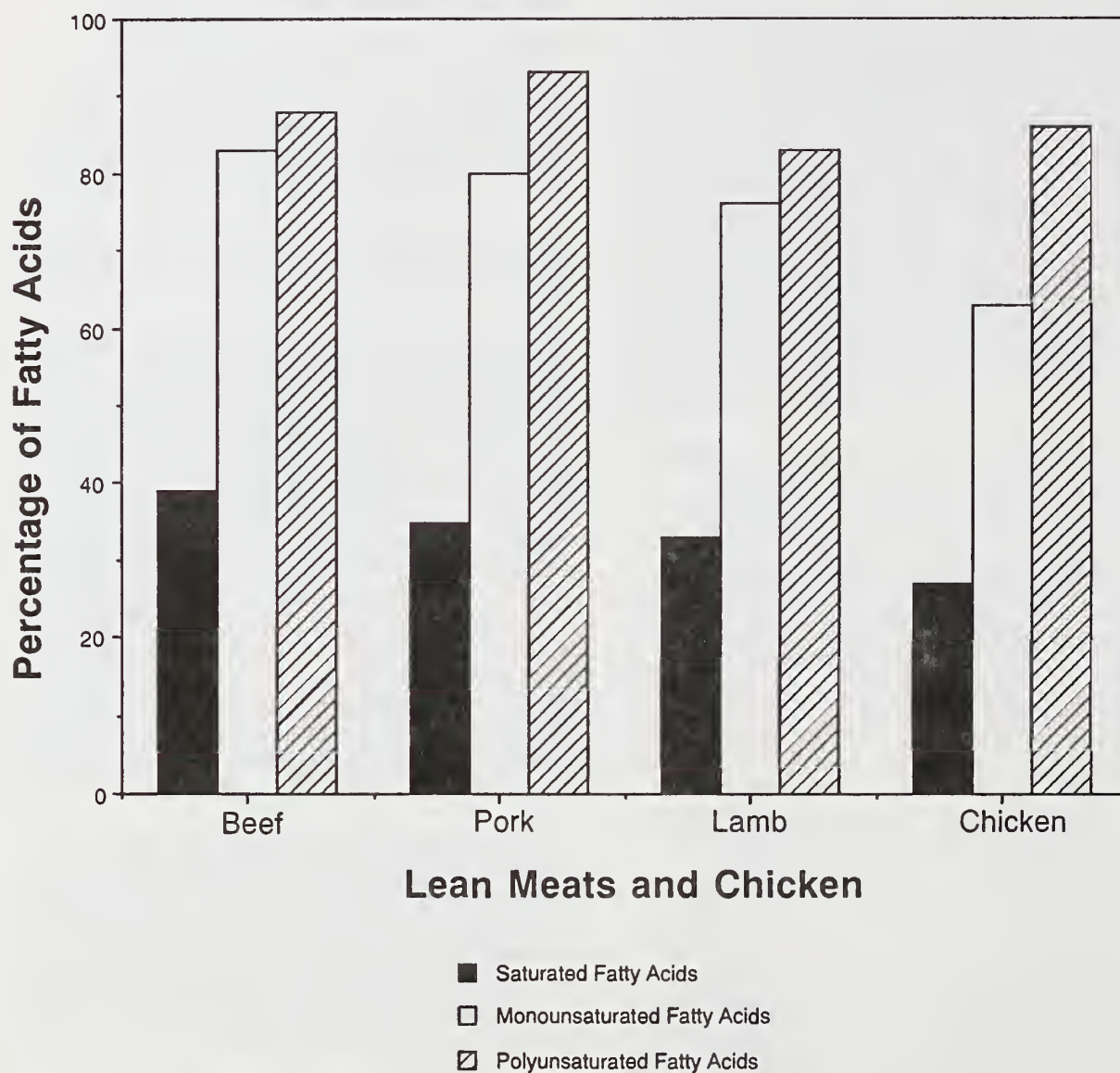


Figure 1.

Beef, pork, lamb and chicken, historically classified as "saturated fats," actually contain more monounsaturated fatty acids than saturated fatty acids.

The data are for lean meats and chicken with all separable fat removed (Anderson et al., 1986). Percentages do not equal 100 because a small percentage of unidentified fatty acids is present.

imitation sour cream) or palm and palm kernel oil (ordinarily found in creamers, cake mixes and commercial cookies). Some less expensive vegetable margarines contain palm kernel, palm, coconut oil or lard. Saturated fatty acids increase cholesterol levels in the blood.

Unsaturated fatty acids in lean meats are of the polyunsaturated and monounsaturated types.

Polyunsaturated fatty acids tend to lower cholesterol levels in the blood. The fatty acids in safflower, corn, cottonseed, sunflower, soybean or canola oils are mainly polyunsaturated.

The fatty acids in avocados, olives, olive oil, peanuts, peanut oil and pecans are mainly monounsaturated. Monounsaturated fatty acids have been shown to lower cholesterol blood levels (Grundy, 1986b). The American Heart Association recommends eating less than 10 percent of total calories from saturated fatty acids, 10 to 15 percent of calories from monounsaturated fatty acids in the diet and up to 10 percent of calories from polyunsaturated fatty acids. Total fat should provide no more than 30 percent of total calories per day.

Are vegetable oils always the best choice for consumers trying to reduce cholesterol and saturated fatty acids as far as the type of fatty acids contained? As illustrated in Figure 2, coconut, palm and palm kernel oils found in many processed foods have the highest amount of saturated fatty acids. Note that the amount of saturated fatty acids present in beef, pork and chicken fats is less than in the tropical oils.

Solid shortenings may be a mixture of saturated and unsaturated fatty acids. Hydrogenation is a process of adding hydrogen to the fatty acid, changing it from a liquid into a more semi-solid or solid form to make the vegetable oil more saturated or hydrogenated. Read the label to learn the type of fat in the shortening, margarines or other fat sources.

Visible Versus Less-visible Fat

Every time butter is added to a slice of bread or dressing is poured on a salad, visible fats are consumed. Less-visible fats and oils are those added to foods either directly, as in meats, or as ingredients in bakery products and other processed foods. Meat group foods are often

erroneously believed to contain a large amount of fat in both the visible and less-visible forms. Today, lean cuts of meat contain much less of both types of fat. (Refer to listing of both types of fat.)

Fats are a necessary and beneficial part of a balanced diet. But making wise choices among the many margarines, oils, dressings and shortenings on the market can help consumers reduce their visible fat consumption and increase the ratio of polyunsaturated to saturated fatty acids in their diet.

Underestimating the amount of fat in food is quite easy. While some foods are obviously high in fat, there are many foods that hide their fat content.

Visible Fat

- Margarine
- Butter
- Cream
- Cooking and salad oils
- Shortening, lard
- Mayonnaise
- Fat between muscle and on outside of meat
- Bacon
- Salad dressings

Less-visible Fat

- Marbling in meats
- Chocolate
- Cheddar and cream cheese
- Nuts
- Potato chips
- Eggs
- Avocado
- Fat in processed meats
- Donuts (fried type)
- Danish rolls
- Croissants
- Cakes
- Pie
- Ice cream

Pure fats and oils provide mostly calories and few other nutrients. Certain foods with high fat content, such as meats, cheese, peanut butter and eggs also furnish important protein, vitamins and minerals.

Coconut/Palm Kernel Oils Contain More "Saturated Fatty Acids" Than Other Fat

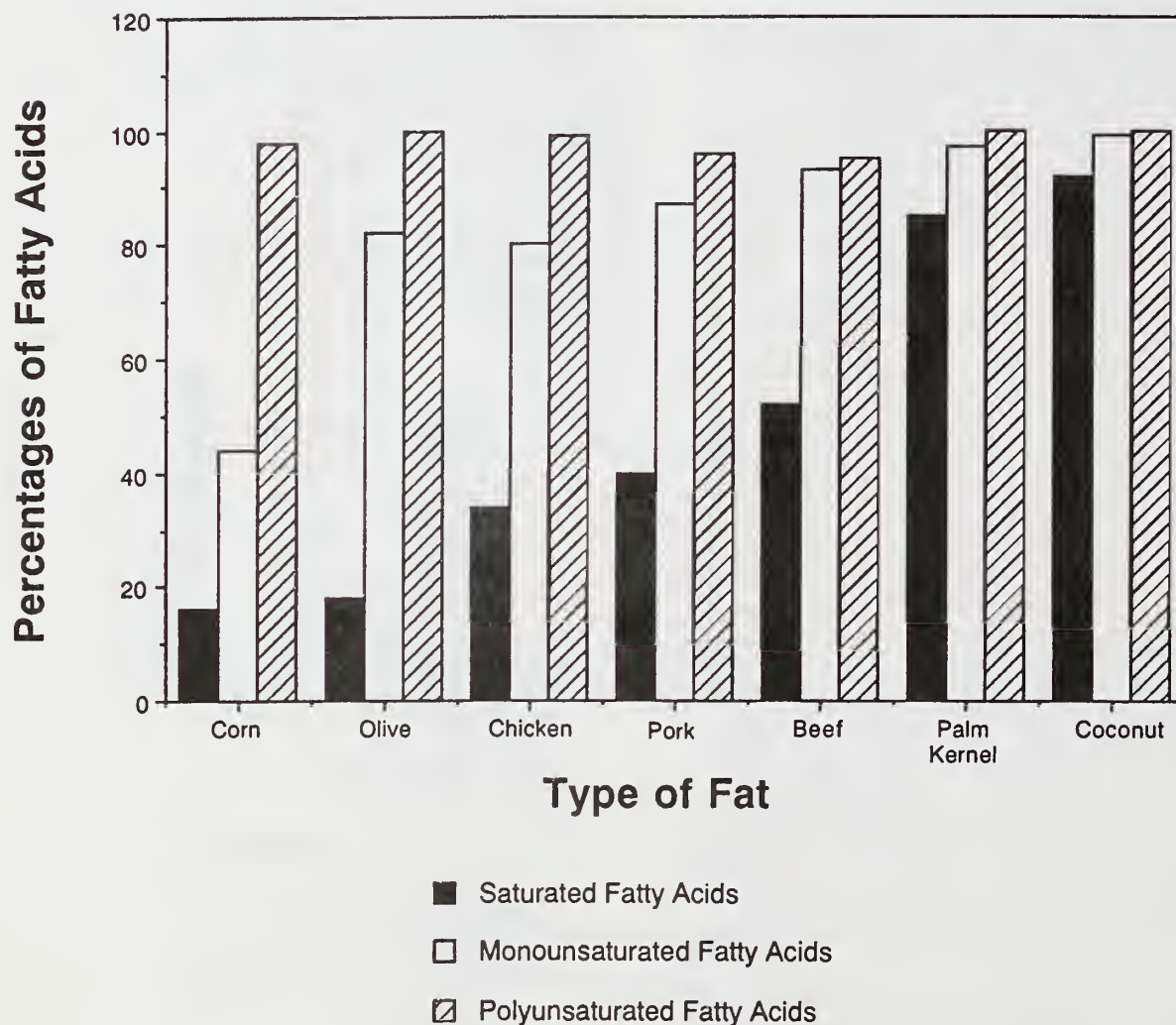


Figure 2.

Percentages of fatty acids in selected common oils/fats (source: Designing Foods: Animal Options in the Market Place, 1988).

Coconut and palm kernel oils clearly contain the greatest amount of saturated fatty acids.

Percentages do not equal 100 because a small percentage of unidentified fatty acids is present.

Form of Fat in Lean Retail Cuts

Consumers want leaner meats with less total fat, saturated fatty acids, dietary cholesterol and calories. Total fat in lean meats comes from these sources:

- Outside (external) fat
- Seam (between muscles) fat
- Marbling (intramuscular) fat

To decrease total fat, remove the outside and seam fats prior to cooking. Retailers presently trim meat cuts to leave only 1/8 inch, 1/4 inch or no external fat on cuts. Marbling contributes to the overall tenderness, juiciness, and flavor of meat and provides insurance of meat quality. If marbling is reduced so that the total fat content drops below 3 percent, the meat is very lean but it has a high probability of being unacceptable to consumers. Meats which contain fat levels between 3 to 7 1/2 percent will be lean enough to be included in most diets recommended by health and public policy groups, and still be considered palatable and acceptable to consumers. Marbling fat contains only minute amounts of dietary cholesterol (2mg per 3-ounce cooked meat serving) in comparison to total cholesterol (about 75 to 80mg in a 3-ounce cooked meat serving) (Bielamowicz, et al., 1990). Restricting marbling in lean meat to less than 3 percent is not practical. In truth, you can still enjoy lean, well-trimmed meat containing a reasonable amount of marbling without sacrificing quality of the meat and without endangering your health.

Lipid Transport System

Fats and dietary cholesterol are transported through the body as lipoproteins (lipo means fat; therefore, this complex is a combination of fat and protein). Fats are insoluble in water and are moved through the blood by the carrier lipoprotein. Three major types of lipoproteins are:

VLDL – Very Low-Density Lipoprotein contains more fat than protein. It contains more triglycerides than cholesterol. High levels of triglycerides in the blood have been linked to risk of developing heart disease. These lipoproteins are important in formation of LDL.

LDL – Low-Density Lipoprotein or “bad cholesterol” contains large amounts of cholesterol and small amounts of protein that are low-density or lighter in weight. Large amounts of LDL or cholesterol carrier in the blood have been shown to be a major risk factor.

HDL – High-Density Lipoprotein or “good cholesterol” has small amounts of cholesterol and other fats and a large amount of more dense or heavier weight protein. Studies have shown that HDL transports cholesterol to the liver from body tissues where it can be utilized or eliminated by the body. High HDL levels may have a protective effect against development of atherosclerosis. Therefore, high HDL levels may indicate a decreased risk of coronary heart disease.

Dietary Cholesterol

High levels of dietary cholesterol in the blood are associated with an increased risk of heart disease. Cholesterol, a steroid (waxy fat) found normally in the blood and tissues of man, is necessary for life and health. Cholesterol in the diet is found only in animal foods and individual differences in dietary cholesterol exist depending on the kinds and amounts of food eaten. Even if the diet contained no cholesterol, more than 1200mg of cholesterol per day are made in the liver. A built-in control (feedback mechanism) in the blood regulates cholesterol production. This control may malfunction in some persons, causing a build-up of cholesterol levels in the blood. The average American eats between 400 and 600mg of cholesterol each day in the form of meat, poultry, fish, shellfish, egg yolk and dairy products. The body regulates its production of blood cholesterol accordingly.

Blood cholesterol is influenced by three factors: the amount of dietary cholesterol eaten, by the body's control of cholesterol production and by the types of fatty acids eaten. Saturated fatty acids raise the cholesterol in the blood in some people. Unsaturated fatty acids substituted for saturated fatty acids have been shown to help lower the cholesterol in the blood of some people. Polyunsaturated fatty acids are recommended in the diet because they lower the blood cholesterol levels. However,

some medical professionals encourage consuming less polyunsaturated fatty acids. Several scientific studies with laboratory animals suggest that consuming polyunsaturated fatty acids increases susceptibility (through suppression of the immune system) to certain forms of cancer.

Heart-Healthy Dietary Changes

To reduce dietary cholesterol and saturated fatty acids in the diet, select two 3-ounce servings of lean meats, or other meat group foods. Controlling serving sizes as well as selecting lean meats and preparing lean meats without adding extra fat are recommended.

When selecting meats or fats used in preparation of meats for reducing dietary fat and cholesterol, look for items that are lower in cholesterol and saturated fatty acid content in the following food groups, more specifically:

Meat Group

Limited Foods

- Limit fried meat, fish and poultry.
- Limit meat with excess fat, such as sausage, bacon or luncheon meats.
- Limit breading or flour added on meat before browning, because both methods cause more fat to be absorbed.

Recommended Foods

- Select well-trimmed (before cooking) lean beef, veal, pork and lamb; chicken and turkey, without the skin; any fish.
- Select meats, fish and poultry with all visible fats removed before cooking.
- Select meats cooked on rack allowing fats to drain off.
- Select gravies, soups and stews from which cooled and hardened fat has been removed.

- Select lean meats that were baked, braised, broiled, poached, steamed or stir-fried with little or no added fat.
- Select marinated lean meats in recommended marinades such as low-calorie Italian dressing or an acid such as lemon or lime juice or vinegar.
- Eat only four or fewer whole eggs per week.
- Use egg whites (use two whites for one egg) or commercial egg substitutes instead of whole eggs to fit within the allowed number of eggs per week.

Milk Group

Limited Foods

- Limit whole dairy products, such as heavy cream, half and half, whole milk, hard cheeses, cream, sour cream and ice cream.

Recommended Foods

- Choose low-fat dairy products such as skim or low-fat milk, low-fat cottage cheese, farmer's cheese, mozzarella, part-skim milk, skim buttermilk and low-fat or non-fat yogurt.
- Read nutritional labels to discover the fat percent (1/2 or 1 percent or 2 percent low-fat) of milk products.
- Select cheeses that have less than 5 percent fat or whose labels state that they have less than 5g of fat per ounce.

Bread and Cereal Group

Limited Foods

- Do not select commercially prepared products and recipes containing large amounts of saturated fatty acids and/or eggs. Products that may be a problem include most varieties of microwaveable popcorn, muffins, cookies, crackers, cakes, pies, custards, desserts, pastries, baking mixes and snack foods.
- Limit croissants, Danish rolls and breakfast rolls with cream cheese.

Recommended Foods

- Read labels on commercial products for those not containing fats and eggs. Fatty acids used in commercial products are usually saturated.
- Choose products made with unsaturated fatty acids or very small amounts of added fat.
- Recommended choices from the Bread and Cereal Group include: bagels, cereals, pasta, rice, potato, corn, air-popped popcorn, plain yeast-risen rolls or breads.
- Buy numerous low-fat bread products such as light varieties or French bread.
- Choose homemade breads because you can reduce oil and fat in recipes or substitute polyunsaturated fatty acids for saturated fatty acids. (For instance, substitute corn oil margarine for butter, plain yogurt made from skim milk for sour cream or skim milk for whole milk.)

Fruits and Vegetables Group

Limited Foods

- Limit vegetables cooked in butter or cream sauces or those prepared in casseroles with saturated fatty acids such as whole milk, soup mixes, etc.
- Do not fry vegetables.

Recommended Foods

- Select any fruit or vegetable prepared without any fat or by the stir-fry method of cookery.
- Select frozen vegetables with no added butter or sauces.

Other Group

Limited Foods

- Limit palm and coconut oils, any hydrogenated oils or shortenings and lard or salt pork.
- Limit meat casseroles or meats made with any of the above (such as less expensive margarines) which list hydrogenated vegetable

oil on the label as they may contain saturated fatty acids.

- Limit commercially fried foods, unless fried with no fat and on a non-stick surface.

Recommended Foods

- Select these following oils containing monounsaturated fatty acids: safflower, soybean, corn, cottonseed blends, canola, olive or peanut.
- Select margarines with liquid safflower, soy, corn or cottonseed oils as the first ingredient; or choose one with more polyunsaturated fatty acids than saturated fatty acids named on the label.

Preparation Methods for Decreasing Dietary Fat and Cholesterol

Since ethnic cookery utilizes lean meats in many dishes, choosing ethnic dishes wisely can help decrease total fat and cholesterol in the diet. For example, when preparing lean tomato-based meat sauces, Italian cooks generously use spices such as thyme, bay leaf, oregano, marjoram, rosemary and basil. Pastas such as spaghetti or the large, flat noodles in lasagna and mushrooms are also characteristic of Italian foods as well as a means of stretching meat in main dishes. Cheeses often added to these dishes contain saturated fatty acids and cholesterol so if cheese is added, it should be one of the varieties listed under the allowed milk group foods. Olive oil, containing largely monounsaturated fatty acids, is the major form of fat used in Mediterranean countries for food preparation. Countries such as Greece, Spain and Italy have a reduced incidence of heart disease. Research by Grundy (1988) supports the concept that a Mediterranean-type diet, high in monounsaturated fatty acids, represents an alternative to changing to a low-fat diet for Americans. Other oils containing monounsaturated fatty acids are peanut, avocado and canola. Imaginative cooks have been successful in changing the most basic ingredients into a gourmet delight.

Lean meat is also eaten in many Oriental dishes prepared by various methods of cookery such as stir-frying, adding fruit flavors and spices and barbecuing in pungent sauces.

Mexican-Americans prepare lean meats using a variety of peppers, chili powder and tomatoes for flavoring. Many different ethnic groups rely on lean meats to add nutritive value, moderation and variety to their menus.

General guidelines for reducing fat and cholesterol are helpful for those who must restrict fat and cholesterol in their diet. You can make changes in the way you prepare more basic foods such as stews, meats or sauces.

Dietary Recipe Modifications to Reduce Dietary Fat and Cholesterol

Modify recipes to reduce fat and cholesterol as follows:

- Remove fat from meats and remove skin from poultry before cooking.
- Broil, roast or bake on a rack to allow fat to drip into a pan.
- Skim fat from stews and soups (refrigerate and let fat congeal on top or place in freezer for 20 minutes).
- Use non-stick pans or vegetable oil sprays, or stir-fry in water instead of oil. Limit batter-fried foods.
- Substitute plain, non-fat or low-fat yogurt and/or light mayonnaise for sour cream in dips and dressings.
- Substitute skim or low-fat milk for whole milk in baking and sauces.
- Substitute two egg whites for one whole egg in baking.
- Substitute "skim milk-based white sauce" for cream sauces or canned soups in casseroles.
- Reduce fat in recipes.

Ways to Reduce Fat in Meat Sauce for Spaghetti

Original	Modified
Cooked Sauce	Cooked Sauce
1 pound ground hamburger, browned (fat drained)	3/4 pound ground round, browned (fat well-drained)
1/4 pound pork sausage, browned (fat drained)	1/2 pound lean ground pork, browned (fat well-drained)
1 1/2 cups diced onion	1 1/2 cups diced onion
2 cloves garlic, minced	2 cloves garlic, minced
1 medium green pepper, diced	1 medium green pepper, diced
1/2 pound fresh mushrooms, sliced	1/2 pound fresh mushrooms, sliced
2 16-ounce cans tomato sauce	2 16-ounce cans tomato sauce
1 6-ounce can tomato paste	1 6-ounce can tomato paste
1 teaspoon salt	1/2 teaspoon salt (optional)
1/8 teaspoon cinnamon	1/8 teaspoon cinnamon
1/4 teaspoon pepper	1/4 teaspoon pepper
2 teaspoons dried basil leaves	2 teaspoons dried basil leaves
2 teaspoons dried oregano leaves	2 teaspoons dried oregano leaves
1/4 cup minced fresh parsley	1/4 cup minced fresh parsley
1 bay leaf	1 bay leaf
Other	Other
8 tablespoons vegetable margarine or butter (for spaghetti noodles)	1 to 2 tablespoons corn or safflower oil (to prevent spaghetti noodles from sticking together)
8 ounces Monterey Jack cheese, shredded	4 ounces part-skim Mozzarella cheese, shredded
4 ounces Parmesan cheese, shredded	Omit Parmesan cheese

Note: Select meat recipes from other ethnic groups to show how their particular meat dishes could be modified to contain less fat.

Leader Lesson Plan

Objectives

After completion of these lessons consumers will be able to:

1. Identify high levels of saturated fatty acids and dietary cholesterol in the diet as contributing factors for risk of developing certain chronic diseases.
2. Define a risk factor as a condition that increases the chance that something will happen.
3. List the major risk factors involved in the development of heart disease (atherosclerosis).
4. Explain the reasons for avoiding too much dietary fat.
5. Describe the effects of different dietary fatty acids on blood cholesterol levels.
6. Determine the types and dietary sources of total fats and fatty acids to assist in wise food selection including moderate consumption of lean meats, fish and poultry.
7. Demonstrate the importance of good nutrition practices by selecting two 3-ounce (cooked) servings of lean-meat-group foods (meat, fish, poultry or meat alternates) daily, controlling serving sizes for meats and other food groups to limit total fat consumption.
8. Explain how to recognize visible versus less-visible sources of fat in the diet, in processed and unprocessed fresh foods.
9. Demonstrate the importance of eating leaner meat products for a heart-healthy diet.
10. Plan a diet based on moderation, variety and limited fat.
11. Determine the food sources of fat so that comparisons can be made among different forms of foods, species and cooking methods.
12. Modify recipes to reduce total fat consumption.
13. Explain that cholesterol is a necessary component in the body.
14. Explain that cholesterol is present in two forms: dietary cholesterol and blood cholesterol.
15. Plan a diet based on moderation and variety while limiting cholesterol.
16. Evaluate food sources of cholesterol in different foods, species and cooking methods.
17. Modify recipes to reduce dietary cholesterol.

Key Concepts

1. Risk factors are linked to certain chronic health conditions including heart disease.
2. High levels of blood cholesterol lead to high risk of heart disease.
3. The dietary guidelines of most health organizations are similar in recommendations for fat and cholesterol reduction.
4. Lean meat contributes fats, cholesterol and important nutrients.
5. Types of fats and fatty acids are found in lean meat.
6. Fatty acids differ in proportion in different food sources.
7. Fatty acids have effects on blood cholesterol levels.
8. Methods are available to keep fat content in lean meats to a minimum.
9. Leaner meat products are important for the heart-healthy diet.
10. Cholesterol has specific functions in the body.
11. Cholesterol is present from two sources: dietary and blood cholesterol.
12. Cholesterol is transported by carriers (lipoproteins) in the blood for utilization or excretion.
13. Americans should know their individual cholesterol levels.
14. Food and product selection and preparation can help reduce cholesterol in the diet.

Leader Lesson Plan

Advance Preparation Guide

1. Review Unit 2 leader guide and lesson plans. Complete the activity and interest-getter before the meeting to understand better the subject matter concepts, objectives and method of presenting the information.
2. Order "A Change of Plate" chart and food models from the National Live Stock and Meat Board. Study the chart and practice the method for presenting the information using the food models included in the set.
3. Review "Nutrition and Your Health—Dietary Guidelines for Americans," Home and Garden Bulletin No. 232, 1985, U.S. Department of Agriculture and U.S. Department of Health and Human Services.
4. Reproduce copies of the following handouts in sufficient quantities for the group meeting.
 - Evaluate Your Fat and Cholesterol Knowledge
 - Fats in the Diet Evaluation
 - Comparison of National Dietary Guidelines of Health Organizations
 - National Dietary Guidelines of Various Health Organizations
 - Test Your Fat and Cholesterol IQ
 - Specific Amounts of Fat, Cholesterol and Sodium in Lean Meats
 - What Foods Contain Cholesterol?
 - Cholesterol Content of Foods
 - Be a Nutrition Whiz—Reduce Fat Content of the Daily Diet
5. Order any additional references, check them out at local library or secure them from the county Extension office. Also, contact state beef, pork or lamb industry councils or the National Live Stock and Meat Board for exhibits on cholesterol and fat as well as other invaluable resources. Invite guests such as community leaders or panel members (suggested additional learning experiences).

6. Use additional materials:

- Newsprint, markers; chalkboard, chalk
- Cuts of lean meat in wrapper
- Waxed paper
- Knife to dissect marbling, and cutting board
- Any demonstration materials needed for the suggested additional learning experiences

7. Decide which additional learning experiences you will use and assemble materials for each one.

8. Order any supplemental references from the supplemental resources list.

Presentation Guide

- A. Diet-Health Issues of Fat and Cholesterol

Setting the Stage

PRE-TEST: Ask participants to complete "Evaluate Your Fat and Cholesterol Knowledge," and "Fats in the Diet Evaluation."

To get the audience's attention, discuss risk factors. List all the risk factors of heart disease on slips of paper without identifying the category on the slip. Have participants play the "Risk Category Unscramble." On the board or paper, have three categories (below) listed:

1. **Major risk factors that can be changed** (high blood pressure [hypertension], blood cholesterol levels and/or triglycerides and cigarette smoking)
2. **Risk factors that cannot be changed** (heredity, sex, age and race)
3. **Contributing factors** (obesity, lack of exercise, stress and diabetes)

Have participants draw the various slips, tell what the risk factor is and place it in the appropriate category explaining why.

End discussion by emphasizing that any one of the major risk factors doubles the risk for developing heart disease. Two risk factors increase the risk four times. All the risk factors increase the risk eight times.

Teaching Steps

DISCUSS: **Diet-Health Issues of Fat and Cholesterol** (refer to the background information). For the population of the United States as a whole, it is sensible to reduce daily intake of total fat, saturated fatty acids and cholesterol. Why? As you have just read, a high blood cholesterol level is considered to be a risk factor. It increases the risk of heart disease, yet the blood cholesterol level of many Americans is undesirably high. Eating a diet high in fat—especially saturated fatty acids and cholesterol—is linked to elevated blood cholesterol levels in some people.

For some persons, high blood cholesterol levels can be reduced by eating diets lower in saturated fatty acids and dietary cholesterol. However, some people can eat diets high in total fat, saturated fatty acids and cholesterol, and still maintain normal blood cholesterol levels.

READ: “The Surgeon General’s Report on Nutrition and Health” statement in the background information. Point out that this recent resource emphasizes the need for fat and cholesterol reduction.

Ask participants: How many know their blood cholesterol levels? Emphasize the need to learn what it is. (You may invite a public health nurse to give the simple test.)

DISCUSS: For adults, blood cholesterol is considered to be high if it measures more than 240 milligrams of cholesterol per deciliter of blood (National Cholesterol Education Program, 1988). (Review cholesterol levels in the background information.) Ask your doctor to check your blood cholesterol.

Reducing total dietary fat is an especially good idea for those limiting calories. The fat in foods provides more calories than carbohydrates or proteins but few vitamins and minerals. Therefore, decreased fat intake results in fewer calories without a reduction in most nutrients.

HANDOUT: “Comparison of National Dietary Guidelines of Health Organizations” summary of total fat and fatty acids and cholesterol recommendations by different health organizations.

DISCUSS: Ask participants today’s normal diet levels for fat and cholesterol. What are recommendations of various health organizations for reduction?

HANDOUT: “National Dietary Guidelines of Various Health Organizations”

ASK: Do you want to reduce your blood cholesterol?

SHOW: Figure 1. Fatty Acid Content of Lean Meats/Chicken. Explain that in each case monounsaturated fatty acids are predominant. (Refer to the background information section.)

EXPLAIN: In the next part of the lesson, more information will be given about dietary fats and how they relate to development of heart diseases.

B. Dietary Fats/Fatty Acids in Lean Meats

Setting the Stage

PRE-TEST: To gain the audience’s interest, begin with the “Test Your Fat and Cholesterol IQ.” Give just 3 to 4 minutes to answer.

Explain that all answers are false. Then read each question and discuss briefly why each is false. Find out how the scores ranged.

Teaching Steps

DISCUSS: Dietary Fats. Lean meats have been claimed to be high in saturated fatty acids and dietary cholesterol.

ASK: Do participants agree or disagree with statement. Why or why not?

DISCUSS: Fats in the food we eat are made up of fatty acids that are either saturated, monounsaturated or polyunsaturated.

- All fat-contributing foods contain these fatty acids in varying amounts.
- No food contains 100 percent of one type of fatty acid.
- Saturated fatty acids are found in all animal products and certain vegetable sources such as coconut, palm or palm kernel oils.

SHOW: Read a food label of non-dairy creamer, non-dairy whipped topping, hydrogenated shortening or saltine crackers, etc. These foods other than animal products contain saturated fatty acids; they are found in all of these processed products. Prominent among these products are coconut, palm and palm kernel oils. Look at Figure 2 ("Coconut and Palm Kernel Oils Contain More Saturated Fatty Acids Than Other Fat" on page 32) and explain that these two oils are almost all saturated fatty acids whereas beef, pork and chicken have more monounsaturated fatty acids than saturated fatty acids. Take time to explain the visual and allow discussion of it.

DISCUSS: Different fatty acids affect blood cholesterol levels as follows:

- Saturated fatty acids are believed to increase cholesterol levels in susceptible persons.

- Monounsaturated fatty acids have been shown to lower cholesterol levels.
- Polyunsaturated fatty acids tend to decrease cholesterol levels.

ASK: How do saturated fatty acids affect blood cholesterol level? Monounsaturated fatty acids? Polyunsaturated fatty acids? Saturated fatty acids are found in varying proportions in lean meats. Of the lean meats, pork has the lowest proportion of saturated fatty acids, followed by beef and lamb. The fat in poultry and fish contains more polyunsaturated fatty acids than the fat in any of the lean meats. (Make reference again to Figure 1 which showed more monounsaturated fatty acids in proportion to saturated fatty acids in beef, pork, lamb and chicken.)

HANDOUT: Specific Amounts of Fat, Cholesterol and Sodium

Discuss the types of fat and cholesterol in fresh meats. Emphasize that the information is based on the latest research information in which lean meat was studied for fatty acids and cholesterol content.

DISCUSS: Write on the board or paper each type of fat as you discuss. Ask participants to name types of fatty acids that they ate during the past day. Ask them to classify fatty acids by type.

DISCUSS: Lean meat can improve our nutritional status by providing the important nutrients listed in Unit 1.

SHOW: On board, write sirloin steak, round steak, ground beef, salami, sausage and bacon. Ask participants to rank them in order of most to least fat per serving.

DISCUSS: Many people believe that if you cannot readily see fat that it is not there. Dietary fat sources

are in both visible and hidden forms which have an effect on total fat consumption. Some fats in meats are visible and easily trimmed away. Muscle cells also contain fat that cannot be removed. Hidden fats are also found in many processed food products such as non-dairy creamers.

SHOW: Fresh lean cuts with three types of fat. Ask volunteers to dissect marbling and explain how it looks. Discuss the background information about marbling in meat.

DISCUSS: Lean meats contain these three forms of fat:

- External (outside)
- Internal (marbling in the muscle)
- Seam (between muscle)

DISCUSS: Fat content of meats depends on:

- The animal's breed (marbling)
- How the animal was fed
- How closely the meat was trimmed (0, 1/8, 1/4 or 1/2 inch remaining)
- How meat was cut
- How meat was processed
- How well-done it is cooked
- The fat added during home preparation (such as frying oil, sauce or gravy)

SAY: To keep fat content in lean meats to a minimum:

- Select lean cuts that are well-trimmed.
- Trim away remaining visible fat before cooking.
- Broil, pan broil, stir-fry or roast.
- Avoid frying, but if you do fry meats, drain or skim fats before serving.
- Add fat-free sauces or serve without sauces or gravy or other fatty condiments.
- Keep serving sizes within those recommended by the dietary guidelines of most health organizations.

DISCUSS:

When shopping for lean meats and other foods containing different types of fat, what facts about processed meats will provide clues to the content of products? Emphasize the importance of reading labels for cholesterol and fatty acids present in processed foods and compare fat levels. Help participants recognize how to detect if fatty acids and/or cholesterol are present. Point out the variety of fat that is included. If the label states that vegetable oil is included, then some saturated fatty acids could be present. Soy, safflower, cottonseed or corn oil margarine would contain a higher percentage of polyunsaturated fatty acids than other margarines containing saturated fatty acids. The label generally states the type of oil used in processing. Consumers should check the label to know if saturated fatty acids are included in vegetable oils. (Have two meat labels on processed meat and several labels of foods containing fats for participants to look at nutrition information and ingredient listings.)

DISCUSS:

Functions of fat. Write on newsprint the six main functions (supply energy; provide satiety; carrier of fat-soluble vitamins; source of essential fatty acid; a substance from which prostaglandins [made from fatty acids present in many tissues including prostate gland, lung, kidney, etc.] are made; and palatability).

CONCLUDE:

In the next lesson, the transport of fatty acids and cholesterol as well as dietary cholesterol will be discussed. Lean meats can be a part of heart-healthy diet recommendations.

C. Cholesterol in Lean Meats

Setting the Stage

To get the audience's interest, provide the handout "What Foods Contain Cholesterol?" Ask participants to check foods containing cholesterol. Answer that only animal products contain cholesterol. Then discuss cholesterol content of foods using as a reference, "Cholesterol Content of Foods." This will help participants realize relative amounts of cholesterol in different animal products.

DISCUSS: Explore cholesterol content of foods according to groups.
Stress the quantity listed.

Cholesterol: Another lipid or fatty-like substance found only in animal foods is cholesterol. The body needs cholesterol for a variety of functions:

- To make bile salts
- To make sex hormones
- To act as a part of myelin, a component of nerve tissue
- To make Vitamin D

Teaching Steps

DISCUSS: Cholesterol in humans is:

- Present in animal foods (meat, fish, poultry, milk products and egg yolks)
- Manufactured in the body by all cells, especially in the liver and small intestines

DISCUSS: Cholesterol is not found in foods of plant origin such as fruits, vegetables, grains, nuts, seeds and dry beans and peas.

Research has not conclusively shown that restriction of dietary cholesterol in the general population reduces the frequency of atherosclerosis. Only about one-fourth to one-half of dietary cholesterol is absorbed into the blood stream. For some people, when dietary cholesterol

intake is reduced, their body compensates by making more cholesterol so little effect is seen on lowering cholesterol level in the blood. Still, follow your doctor's advice regarding the reduction of cholesterol and saturated fatty acids in the diet since reducing cholesterol alone may be a futile effort in reducing blood cholesterol and to improve cardiovascular health.

As noted in the first part of this program, Americans should know their serum cholesterol level including HDL "good cholesterol" and LDL "bad cholesterol" (National Cholesterol Education Program, 1988). How many now know their cholesterol levels? Now let's see how blood cholesterol is transported in the blood by the body's transport system. Visualize blood which is water-based. To move through the blood, the cholesterol and fat must be attached to a transport system before it can be moved.

SHOW:

A bottle half full of water. Then pour salad oil into the bottle. Add a small piece of outside trimmed fat from meat. The liquid fat and the outside fat, which is less dense or lighter in weight, floats on water indicating lower density. Now add a piece of lean meat with no fat and drop it into the water. It is heavier or more dense and drops immediately to the bottom of the glass.

DISCUSS:

There are two main carrier systems for fat and cholesterol called lipoproteins. Explain that the "**good cholesterol**" HDL (heavy or high-density lipoprotein) contains more protein in relation to cholesterol and triglycerides. The "**bad cholesterol**" LDL (light or less-density lipoprotein) contains more triglycerides and fats than protein. You saw when we

demonstrated the fat floating on water that fat is lighter in weight than water-based liquids. More fat in relation to protein is found in low-density lipoproteins. High-density lipoproteins contain more protein in relation to fat as demonstrated when the heavy protein fell to the bottom of the bottle of water. Use this example to explain the characteristics of lipoproteins. Now you see that the lipoproteins or carriers of cholesterol and triglycerides in the blood are all made of protein and lipids so that they can carry cholesterol and other lipids which do not dissolve in water-based fluids such as the blood. This lipid transport system of lipoproteins is made of the following:

DISCUSS: **HDL-High-Density Lipoproteins** "good cholesterol" contain more protein heavy in weight (greater density) and less fat (fat weighs less and is less dense). Studies have shown that HDL transports cholesterol to the liver from body tissues where it can be utilized in the manufacturing of body components such as hormones, bile salts and Vitamin D to be eliminated by the body. High HDL levels may have a protective effect against development of atherosclerosis. High HDL levels may indicate a decreased risk of coronary heart disease.

HDL is considered good type of cholesterol mainly because it carries cholesterol to the liver to be:

- Utilized for manufacturing various body components (bile, Vitamin D, sex hormones).
- Excreted as waste

DISCUSS: **LDL-Low-Density Lipoproteins** "bad cholesterol" contain more fat (weigh less or less dense) and less protein (heavy).

Large amounts of LDL in blood have been shown to be a major risk factor.

LDL is considered the bad type of cholesterol because it carries the cholesterol directly to the cell to be deposited in a build-up of fatty materials in the artery walls or stored in the body tissues.

DISCUSS: **VLDL-Very Low-Density Lipoprotein** is important because it is the lipoprotein that forms LDL. This lipoprotein contains more triglycerides and less cholesterol.

SHOW: Use food models from National Live Stock and Meat Board (NLSMB), "A Change of Plate," when discussing serving sizes of meats.

DISCUSS: A 3-ounce serving of lean meats provides about 70mg of cholesterol.

Organ meats (brains, liver and sweetbreads) contain significant amounts of cholesterol and should be eaten less frequently than other lean meat sources.

The American Heart Association and National Cholesterol Education Program (1988) recommend consumption of less than 300mg of cholesterol from foods each day.

SHOW: "A Change of Plate" food models and/or a deck of cards in a box for illustrating the size and depth of a 3-ounce serving size of meat.

SHOW: Show how to remove external and seam fat from a steak.

DISCUSS: All external fat should be removed prior to cooking to reduce fat and cholesterol. Marbling is not possible to remove so select meats with more lean muscle and less marbling and external fat. In

other words, buy mostly red (muscle) with minimal amount of white (fat).

DISCUSS: Ways to reduce fat and cholesterol in recipes for main dishes or meats.

HANDOUT: "Be a Nutrition Whiz—Reduce Fat Content of the Daily Diet" handout. Ask participants to complete the exercise for substitution and the portion size. This will evoke discussion and good ideas to share with the group.

DISCUSS: If the lean meat is mostly red with minimal amounts of white marbling (between 3 to 7 percent fat), it can fit into the total fat recommendations of the American Heart Association Guidelines as well as other health organizations (Designing Foods in the Marketplace, 1988). Use Select or Choice grades to stay within these total fat levels.

Most of the meat found in the supermarket is either Select or Choice USDA quality grade. On the average, Select will contain 4 to 6 percent fat, and Choice will contain 6 to 8 percent fat. Prime, found mostly in meats served in restaurants, may be as high as 8 to 10 percent fat.

Do not add fat directly to the meat or add it in the form of sauces. That will defeat your purpose of reducing fat and cholesterol. Avoid pan-frying or deep fat frying. This method of cookery adds 1 teaspoon of fat (45 calories per ounce) for each ounce to the total fat content of the meat.

DISCUSS: Ways to limit fat and cholesterol in the diet (refer to Heart-Healthy Dietary Changes and Recipe Modifications for Decreasing Fat and Cholesterol in Background Information). Write the recipe for spaghetti sauce on the board/paper. Ask

participants to tell how they would modify the recipe to reduce fat content.

DISCUSS: Ways to limit fat and cholesterol in each food group, and discuss how to:

- Limit fat and cholesterol in Meat Group foods. Use the food guide for your discussion of how to limit fat and cholesterol in selecting a well-balanced diet.
- Select number of recommended servings when discussing each group.
- Reduce serving sizes in meat selections. This is more difficult since most people do not have a scale.
- Use food models or actual cuts of meat to demonstrate the size of a 3-ounce serving.

DISCUSS: Ask what "trade-offs" are. "Avoid too much fat and cholesterol" does not mean "never to eat lean meats" because it contains fat or "never to eat egg yolks" because they contain cholesterol. What is important is the total amount of fat, saturated fatty acids and cholesterol in your diet. While you may want to reduce your intake of some foods, you need not eliminate them from your diet completely. Instead, balance high-fat foods with other foods that contain less fat and cholesterol.

The following "trade-offs" are equations that show approximately how much fat is in some typical foods. Foods on each side of the equation provide about the same amounts of protein, fat, vitamins and minerals. Use these trade-off equations to help you moderate fat intake. An equivalent of fat is equal to 1 teaspoon = 5g = 45 calories.

DISCUSS: Meat trade-offs are as follows:
(Write on paper as you discuss.)

- 2 ounces bologna = 1 ounce lean meat
+ 3 teaspoons fat
- 2 tablespoons = 1 ounce lean meat
peanut butter + 3 teaspoons fat
- 1/4 cup seeds = 1 ounce lean meat
+ 3 teaspoons fat
- 1/3 cup nuts = 1 ounce lean meat, fish or
poultry + 5 teaspoons fat

Trade-offs help us to substitute one food so we can eat many others.

SUMMARIZE: This unit has shown the facts about the link between fat and cholesterol and the risk of developing heart disease. Lean meats fit into the heart-healthy diets, and they are necessary to maintain good nutrition through variety and moderation.

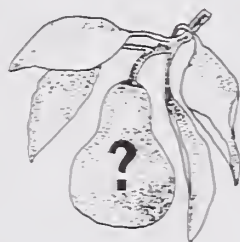
Handouts

- Evaluate Your Fat and Cholesterol Knowledge
- Fats in the Diet Evaluation
- Comparison of National Dietary Guidelines of Health Organizations
- National Dietary Guidelines of Various Health Organizations
- Test Your Fat and Cholesterol IQ
- Specific Amounts of Fat, Cholesterol and Sodium in Lean Meats
- What Foods Contain Cholesterol?
- Cholesterol Content of Foods
- Be a Nutrition Whiz—Reduce Fat Content of the Daily Diet

Evaluate Your Fat and Cholesterol Knowledge

Code/Name _____

Telephone _____



Circle true or false.

1. T F Fruits, vegetables and most breads and cereals have little fat.
2. T F Fruits contain cholesterol.
3. T F Lean meat without external fat contains less fat, but not much less cholesterol than lean meat with external fat.
4. T F Cholesterol is found in both the lean and fat portions of meat.
5. T F Trimming fat from meat prior to cooking reduces the calories of the cooked product.
6. T F Meat should be roasted on a rack so fat will drain off.
7. T F Mozzarella cheese (part skim milk) has less fat than cheddar cheese. Therefore, when preparing meat casseroles containing cheese, add part skim milk cheeses to reduce some fat.
8. T F Lean beef or pork contains about the same amount of dietary cholesterol as chicken.
9. T F Meats contain all saturated fatty acids, so they should be classified as saturated fat.
10. T F Avocados contain no cholesterol or fat.
11. T F Processed meats such as bologna or wieners contain less fat and cholesterol than other meats.
12. T F Brains and other organ meats are rich sources of cholesterol.
13. T F For many people, dietary cholesterol need not be restricted.
14. T F High serum cholesterol is only one of many factors in heart disease.
15. T F All vegetable oils are good sources of polyunsaturated fatty acids and should replace animal fats.

Prepared by Mary Kinney Bielamowicz, Ph.D., R.D., L.D., Extension Nutrition Specialist,
The Texas A&M University System, April, 1990.



Evaluate Your Fat
and Cholesterol Knowledge
Key: Unit 2

1. T
2. F
3. T
4. T
5. T
6. T
7. T
8. T
9. F
10. F
11. F
12. T
13. T
14. T
15. F

Prepared by Mary Kinney Bielasowicz, Ph.D., R.D., L.D., Extension Nutrition Specialist,
The Texas A&M University System, April, 1990.



Fats in the Diet Evaluation

1. Check each food that contains any fat:

apples	_____	cocoa	_____
avocados	_____	chocolate	_____
mustard	_____	baked potato	_____
mayonnaise	_____	potatoes au gratin	_____
bouillon	_____	peanuts	_____
broccoli cream soup	_____	pecans	_____
eggs	_____	sausage pizza	_____
bacon	_____	commercial cake mix	_____
cheddar cheese	_____	commercial sponge cake	_____
sirloin steak	_____	wieners	_____
salami	_____	whole milk	_____
peanut butter	_____	2 percent milk	_____
jelly	_____	buttermilk (skim)	_____
ice cream	_____	skim milk	_____
sherbet	_____	tortilla	_____
macaroni and cheese	_____	tortilla chips	_____
corn chips	_____	potato chips	_____

2. List 5 changes you will make to reduce fat in recipes.

a.
b.
c.
d.
e.

3. Circle the number of servings of each food group that you normally eat per day.

Food groups	Serving size	Servings per day
Meat	(3 ounce)	1 2 3 4 5 6
Milk	(1 cup)	1 2 3 4 5 6
Fruit/Vegetable	(1/2 cup)	1 2 3 4 5 6
Bread/Cereal	(1 slice or 1/2 cup)	1 2 3 4 5 6
Fat	(1 teaspoon)	1 2 3 4 5 6
Sugars	(1 teaspoon)	1 2 3 4 5 6
Alcohol	(1 ounce)	1 2 3 4 5 6

Comparison of National Dietary Guidelines of Health Organizations

The dietary guidelines published by medical and public health organizations are for promoting and maintaining optimum health in the general population. Additional specific guidelines are offered as nutritional therapy when a disease is treatable by changing one or more dietary components (i.e., cardiovascular disease or gastrointestinal diseases). The following general dietary guidelines from major organizations are compared and contrasted.

All sources reviewed recommended a reduction in dietary fat and avoidance of obesity. The U.S. Department of Agriculture/U.S. Department of Health and Human Services (USDA/DHHS) guidelines endorsed by the recent report "The Surgeon General's Report on Nutrition and Health," 1988, were the most broad, suggesting avoidance of "too much fat, saturated fatty acids and cholesterol." The National Research Council-National Academy of Sciences (NRC/NAS), the American Diabetes Association (ADA), and the American Cancer Society (ACS) advised the reduction of total fat intake to 30 percent of total calories; the Recommended Dietary Allowances (RDA) by the Food and Nutrition Board of the NRC/NAS, suggest the total fat intake be reduced so fat is not more than 35 percent of dietary energy.

The American Heart Association (AHA) and the National Institutes of Health (NIH) both suggest identical and more detailed guidelines for reducing dietary fat intake. They recommend that the caloric intake from fats be reduced to 30 percent (from the current level of about 35 to 40 percent). Saturated fatty acids should be reduced to less than 10 percent of total calories. Polyunsaturated and monounsaturated fatty acid intake should each be greater than or equal to 10 percent of the total caloric intake. The suggested total daily cholesterol intake in NIH, AHA and ADA guidelines should be between 250 to 300mg. Weight control and maintenance, moderation and variety are stressed.

The USDA/DHHS and AHA recommend avoidance of too much sodium; the ACS and the NRC/NAS both advise minimizing consumption of food preserved by salt curing, salt pickling or smoking. The USDA/DHHS, NRC/NAS and ACS all recommend including foods with adequate fiber; NRC/NAS and ACS additionally suggest the inclusion of foods rich in vitamins A and C, and cruciferous vegetables (cabbage, broccoli, brussels sprouts, kohlrabi and cauliflower). The RDA's suggest that the intake of refined sugar be reduced and complex carbohydrates maintained or even increased. The guidelines from USDA/DHHS, NRC/NAS and the ACS all recommend that if alcohol is consumed, it be done in moderation. These findings are summarized in the attached table.

National Dietary Guidelines of Various Health Organizations

	U.S. Diet	AHA	ACS	NRC-NAS RDA's	USDA/DHHS	NIH	NCI
Caloric Intake		Maintain ideal body weight	Avoid obesity	Avoid obesity	Maintain desirable weight	Achieve and maintain ideal weight	Achieve and maintain ideal weight
Fats							
Total calories	36 to 37%	< 30%	30%	≤ 30%	avoid "too much"	30%	no more than 30%
Fatty acids							
• Saturated	13%	< 10%		< 10%	avoid "too much"	*1. ≤ 10% 2. ≤ 7% ≥ 10%	decrease ≤ 10%
• Monounsaturated	14%	≥ 10%				10%	8 to 10%
• Polyunsaturated	7%	< 10%		8 to 10%			
Cholesterol	300 to 600mg	≤ 300mg/day		< 300mg/day	avoid "too much"	*1. 300mg/day 2. 200mg/day	≤ 300mg/day
Protein	12 to 20%	10 to 20%	12 to 20%	12 to 20%	12 to 20%	10 to 20%	12 to 20%
Carbohydrates							
(total calories)	45%	55%		increase		50 to 60%	55 to 60%
Refined				decrease	avoid "too much"	decrease	decrease
Complex		increase		maintain or decrease			maintain or increase
Fiber			increase, include cruciferous vegetables	increase	include adequate	5 to 15% soluble fiber including pectins, gums and psyllium; (e.g., oats, legumes)	increase to 20 to 30g but no more than 35g
Vitamin A			include daily	include daily			include daily
Vitamin C			include daily	include daily			include daily
Sodium	4 to 6g	≤ 3g	moderate consumption	< 2 to 4g < 6g (salt)	avoid "too much"	≤ 3g	decrease
Alcohol			moderate consumption	less than 1 ounce pure alcohol	moderate consumption		in moderation—no more than one or two drinks daily

AHA: American Heart Association; ACS: American Cancer Society; USDA-DHHS: U.S. Department of Agriculture-Department of Health and Human Services (same recommendations as the Surgeon General's Report on Nutrition and Health); NIH: National Institutes of Health; Consensus Development Panel: Recommended Dietary Allowances NRC-NAS: National Research Council-National Academy of Sciences; NCI: National Cancer Institute.

*Refers to two Phases of Dietary Treatment.

Resource: Designing Foods—Animal Options in the Market Place. National Academy of Sciences Press, Washington, DC.

Adapted by Mary Kinney Bielamowicz, Ph.D., R.D., L.D., Extension Nutrition Specialist, Texas Agricultural Extension Service, The Texas A&M University System, October, 1990.



Test Your Fat and Cholesterol IQ

Code/Name _____

Telephone _____

Circle true or false.

1. T F All fatty foods contain cholesterol.
2. T F Cholesterol content of the diet is the major determinant of cholesterol in the blood.
3. T F Trimming fat from meat does not reduce cholesterol content in the meat.
4. T F Avoid increasing dietary cholesterol by not eating vegetable and animal fats altogether.
5. T F Dietary cholesterol is always bad regardless of amount.
6. T F Increasing dietary cholesterol automatically raises blood cholesterol.
7. T F Lean meats need not concern a cholesterol-conscious person.
8. T F Cholesterol is responsible for "thick" blood.
9. T F Vegetable oils on salads add cholesterol to the diet.
10. T F A safe method to lower blood cholesterol does not exist.
11. T F Cholesterol is carried in the blood by LDL directly to the liver.
12. T F HDL cholesterol is deposited in the cell, leading to build-up of plaque in the artery walls.

Prepared by Mary Kinney Bielamowicz, Ph.D., R.D., L.D., Extension Nutrition Specialist,
The Texas A&M University System, October, 1990.

C

A

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2

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28

Fat and Cholesterol IQ

Key: Unit 2

Answers to all questions are false, because of the following reasons:

1. Cholesterol is found only in animal products and is necessary in maintaining cell structure.
2. Fatty acid type and amount, rather than dietary cholesterol, have been shown to have greater effects on blood cholesterol levels.
3. Marbling (intramuscular fat) and external (subcutaneous) fat contain about 117 and 114mg of cholesterol per 100g of fat, respectively. Selecting lean meats with less marbling and trimming all external fat prior to preparation are recommended.
4. Although only animal fats contain cholesterol, both vegetable and animal fats may contain saturated fatty acids, shown to increase blood cholesterol levels. Dietary cholesterol alone may not increase blood cholesterol levels.
5. Many of 35 sex hormones, bile acids and Vitamin D have the same chemical structure as cholesterol. Cholesterol is a necessary component in the production of these substances in the body.
6. The body manufactures about 1200mg of cholesterol daily. In some individuals, the enzyme that detects the level of cholesterol in the blood does not function properly. The type of fatty acid (saturated, monounsaturated or polyunsaturated) has been shown to alter cholesterol levels in most individuals more than the cholesterol content of foods eaten.
7. Lean meats are animal products and do contain cholesterol and some saturated fatty acids. However, lean meats contribute many nutrients such as protein, iron and B-vitamins and should be included in a heart-healthy diet.
8. Cholesterol and fat accumulate in the arteries in the form of plaque. However, cholesterol does not thicken the blood.
9. Oils or shortenings are usually of vegetable origin. Although only animal products contain cholesterol, oils (palm kernel or coconut) may contain saturated fatty acids, which may have an effect on cholesterol levels.
10. By lowering dietary cholesterol to 300mg daily and fat consumption to 30 percent of the total calories, blood cholesterol levels may be reduced. Some drugs are also effective in lowering cholesterol.
11. LDL and HDL are the lipoproteins (carriers of cholesterol) in the blood. High-density lipoproteins (HDL) carry cholesterol to the liver to be utilized in production of bile, sex hormones, etc., or to be excreted as waste if not utilized.
12. Low-density lipoproteins (LDL) cause cholesterol to be deposited directly into the cell wall, leading to the gradual build-up of plaque in the artery walls.

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Specific Amounts of Fat, Cholesterol and Sodium in Lean Meats

Lean Meats ^{a,b} /100g serving (3 1/2 ounces)	Total fat	Saturated fatty acids	Monounsaturated fatty acids	Polyunsaturated fatty acids	Cholesterol		Sodium
					grams	milligrams	
Beef composite of trimmed retail cuts, lean only							
• Prime	8.8	3.4	3.8	0.4	59	63	
• Choice	6.6	2.6	2.9	0.3	60	63	
• Select	5.5	2.1	2.4	0.2	60	63	
Beef retail cuts, Choice grade, (lean only)							
• Rib (strip steak)	8.5	3.5	3.8	0.3	59	63	
• Eye of Round (round steak)	4.5	1.6	1.9	0.2	54	53	
• Tenderloin	6.8	2.7	2.7	0.3	62	54	
Beef retail cuts, Select grade, (lean only)							
• Rib (strip steak)	6.7	2.8	3.0	0.2	59	63	
• Eye of Round (round steak)	3.7	1.3	1.6	0.2	54	53	
• Tenderloin	5.8	2.3	2.3	0.3	62	54	
Beef retail ground beef							
• Extra Lean	17.1	6.8	7.4	0.7	69	66	
• Lean	20.7	8.3	9.0	0.9	75	69	
• Regular	26.6	10.8	11.6	1.1	85	68	
Lamb retail cuts, lean							
• Loin Chop	5.7	1.9	2.4	0.4	67	72	
• Leg—Sirloin	4.7	1.5	1.9	0.4	66	68	
• Leg—Shank	3.8	1.2	1.5	0.3	64	66	
Pork composite of leg, loin and shoulder, lean only							
	6.8	2.3	3.1	0.7	65	64	
Pork retail cuts							
• Leg—Rump	5.3	1.9	2.4	0.6	61	69	
• Loin—Center	7.2	2.5	3.2	0.8	66	63	
• Loin—Sirloin	6.8	2.3	3.1	0.7	63	50	
• Tenderloin	2.5	0.9	1.1	0.3	65	49	
• Bacon	57.5	21.3	26.3	6.8	67	685	

^a100g serving raw= 84g cooked (about 3 ounces)

^bAdapted from U.S. Department of Agriculture, Handbook 8-13, 1986. Composite data presented are for lean only.

^cData for lamb are from the following source: Ono, K., Berry, B.W., Johnson, H.D., Russek, E., Parker, C.F., Cahill, V.R. and Althouse, P.G. 1984. J. Food Sci. 49:5.

Prepared by Mary Kinney Bielamowicz, Ph.D., R.D., L.D., Extension Nutrition Specialist, The Texas A&M University System, October, 1990.

What Foods Contain Cholesterol?

Check the foods that contain cholesterol.



- | | | |
|-----|------------------------|-------|
| 1. | Fish | _____ |
| 2. | Baking chocolate | _____ |
| 3. | Brains | _____ |
| 4. | Whole milk | _____ |
| 5. | Liver | _____ |
| 6. | Poultry | _____ |
| 7. | Carrot | _____ |
| 8. | Banana | _____ |
| 9. | Clams | _____ |
| 10. | Kidney | _____ |
| 11. | Cream | _____ |
| 12. | Beef, pork or lamb | _____ |
| 13. | Ice cream | _____ |
| 14. | Skim milk | _____ |
| 15. | Sour cream | _____ |
| 16. | Avocado | _____ |
| 17. | Egg yolk | _____ |
| 18. | Egg white | _____ |
| 19. | All Meats | _____ |
| 20. | All Milk Products | _____ |
| 21. | All Breads, Cereals | _____ |
| 22. | All Fruits, Vegetables | _____ |
| 23. | Animal Fats | _____ |
| 24. | Vegetable Fats | _____ |

Prepared by Mary Kinney Bielasowicz, Ph.D., R.D., L.D., Extension Nutrition Specialist,
The Texas A&M University System, October, 1990.

What Foods Contain Cholesterol? Key: Unit 2

1. Yes
2. No
3. Yes
4. Yes
5. Yes
6. Yes
7. No
8. No
9. Yes
10. Yes
11. Yes
12. Yes
13. Yes
14. Yes
15. Yes
16. No
17. Yes
18. No
19. Yes
20. No
21. No
22. No
23. Yes
24. No

Cholesterol Content of Foods

(in ascending order)^{1,2,3}

Food	Amount	Cholesterol (mg)
Milk, skim, fluid or reconstituted dry	1 cup	4
Sour cream	1 tablespoon ⁴	5
Cottage cheese, uncreamed	1/2 cup	5
Mayonnaise	1 tablespoon	8
Lard	1 tablespoon	12
Cottage cheese, creamed	1/2 cup	17
Cream, half and half (cream and milk)	1/4 cup	22
Ice cream, regular, approximately 11 percent fat	1/2 cup	29
Cheese, cheddar	1 ounce	30
Butter	1 tablespoon	31
Milk, whole	1 cup	33
Cream, light table	1/4 cup	40
Oysters, salmon	3 ounces, cooked	40
Clams, halibut, tuna	3 ounces, cooked	51
Chicken, turkey (light meat)	3 ounces, cooked	59
Beef, lean only, rib, round and tenderloin cuts	3 ounces, cooked	67
Lamb, lean only, loin, blade, rib, leg, sirloin and shank	3 ounces, cooked	77
Pork, lean only of leg and loin only, cooked	3 ounces, cooked	79
Veal, lean only	3 ounces, raw	75
Chicken/turkey (dark), lean only, cooked	3 ounces, cooked	79
Shrimp	3 ounces, cooked	128
Heart, beef	3 ounces, cooked	164
Egg yolk	1 yolk, or 1 egg	250
Liver, beef, calf, pork, lamb	3 ounces, cooked	400
Kidney	3 ounces, cooked	680
Brains	3 ounces, raw	more than 1700

¹Anderson, B.A., Lauderdale, J.L. and Hike, I.M. 1986. Composition of Foods—Raw, Processed, Prepared. U.S. Department of Agriculture Handbook No. 8-13.

²Gebhardt, S.E. and Matthews, R.H. 1986. Nutritive Value of Foods. Home and Garden Bulletin, No. 72. U.S. Department of Agriculture, Washington, DC.

³Ono, K., Berry, B.W., Johnson, H.K., Russek, E., Parder, C.F., Cahill, V.R., and Althouse, P.G. 1984. Nutrient Composition of Lamb. J. Food Sci. 49:5.

⁴Tablespoons are level, not rounded.



The
Consumer's Choice

Be a Nutrition Whiz—Reduce Fat Content of the Daily Diet

Fill in changes in foods and/or portion sizes to provide less fat.

Meals	Traditional	Portion	Modified	Portion	Meals	Traditional	Portion	Modified	Portion
Breakfast	Bran cereal	1 ounce	_____	_____	Breakfast	Oatmeal	1 cup	_____	_____
	Whole milk (3.3% fat)	3 ounces	_____	_____		Grapofruit juice	8 ounces	_____	_____
	Banana	1	_____	_____		Cured ham (11% fat)	3.5 ounces	_____	_____
	Cinnamon roll/butter	1 large	_____	_____		Coffee	6 ounces	_____	_____
	Coffee	6 ounces	_____	_____		with light cream	1 tablespoon	_____	_____
Lunch	with light cream	1 teaspoon	_____	_____	Lunch	Chicken leg, batter-fried	3.5 ounces	_____	_____
	Sandwich with Ham (11% fat)	1.75 ounces	_____	_____		Baking powder biscuits	1	_____	_____
	Swiss cheese	1 ounce	_____	_____		with butter	1 pat	_____	_____
	Tomato	1/2	_____	_____		Sliced tomatoes	1	_____	_____
	Mayonnaise	1 tablespoon	_____	_____		Fresh peach	1	_____	_____
Snack	Whole wheat toast	1 slice	_____	_____	Snack	Milkshake	12 ounces	_____	_____
	Fresh pear	1	_____	_____		Yogurt (whole milk)	1 cup	_____	_____
	Cola drink	12 ounces	_____	_____		Fresh strawberries	1 cup	_____	_____
	Yogurt (whole milk)	8 ounces	_____	_____		Beef, chuck, blade	3.5 ounces	_____	_____
	Oat bran muffin	1	_____	_____	Dinner	Choice	_____	_____	_____
Dinner	Jam	1 tablespoon	_____	_____		Macaroni	1 cup	_____	_____
	Lamb, leg	3 ounces	_____	_____		American cheese	2 ounces	_____	_____
	Baked potato, skin with sour cream	2 tablespoons	_____	_____		Broccoli / Hollandaise	2 spears	_____	_____
	Asparagus	4 spears	_____	_____		Pound cake with Whipped cream topping	1 slice	_____	_____
Snack	Cantaloupe with Ice cream (10% fat)	1/2	_____	_____		Coffee	2 tablespoons	_____	_____
	Coffee	1/2 cup	_____	_____	Dinner	with light cream	6 ounces	_____	_____
	with light cream	6 ounces	_____	_____		Beef, chuck, blade	1 tablespoon	_____	_____
	Yogurt (whole milk)	1	_____	_____		Choice	_____	_____	_____
	Oat bran muffin	1	_____	_____		Macaroni	1 cup	_____	_____
Dinner	Jam	1 tablespoon	_____	_____		American cheese	2 ounces	_____	_____
	Lamb, leg	3 ounces	_____	_____		Broccoli / Hollandaise	2 spears	_____	_____
	Baked potato, skin with sour cream	2 tablespoons	_____	_____		Pound cake with Whipped cream topping	1 slice	_____	_____
	Asparagus	4 spears	_____	_____		Coffee	2 tablespoons	_____	_____
	Cantaloupe with Ice cream (10% fat)	1/2	_____	_____		with light cream	6 ounces	_____	_____
Snack	Coffee	1/2 cup	_____	_____		Beef, chuck, blade	1 tablespoon	_____	_____
	with light cream	6 ounces	_____	_____		Choice	_____	_____	_____
	Yogurt (whole milk)	1	_____	_____		Macaroni	1 cup	_____	_____
	Oat bran muffin	1	_____	_____		American cheese	2 ounces	_____	_____
	Jam	1 tablespoon	_____	_____		Broccoli / Hollandaise	2 spears	_____	_____
Dinner	Lamb, leg	3 ounces	_____	_____		Pound cake with Whipped cream topping	1 slice	_____	_____
	Baked potato, skin with sour cream	2 tablespoons	_____	_____		Coffee	2 tablespoons	_____	_____
	Asparagus	4 spears	_____	_____		with light cream	6 ounces	_____	_____
	Cantaloupe with Ice cream (10% fat)	1/2	_____	_____		Beef, chuck, blade	1 tablespoon	_____	_____
	Coffee	1/2 cup	_____	_____		Choice	_____	_____	_____
Snack	with light cream	6 ounces	_____	_____		Macaroni	1 cup	_____	_____
	Yogurt (whole milk)	1	_____	_____		American cheese	2 ounces	_____	_____
	Oat bran muffin	1	_____	_____		Broccoli / Hollandaise	2 spears	_____	_____
	Jam	1 tablespoon	_____	_____		Pound cake with Whipped cream topping	1 slice	_____	_____
	Lamb, leg	3 ounces	_____	_____		Coffee	2 tablespoons	_____	_____
Dinner	Baked potato, skin with sour cream	2 tablespoons	_____	_____		with light cream	6 ounces	_____	_____
	Asparagus	4 spears	_____	_____		Beef, chuck, blade	1 tablespoon	_____	_____
	Cantaloupe with Ice cream (10% fat)	1/2	_____	_____		Choice	_____	_____	_____
	Coffee	1/2 cup	_____	_____		Macaroni	1 cup	_____	_____
	with light cream	6 ounces	_____	_____		American cheese	2 ounces	_____	_____

After you have completed changing the foods to provide less total fat, you may want to run a computer program such as PruCal™, Food Processor™, Nutrition Wizard™, or simply look up the food values in USDA Handbooks for various nutritional values.

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NUTRITION

Suggested Learning Experiences:

1. Use containers for commercial meat-containing products such as skillet or one-dish meals, non-dairy products and other convenience foods to illustrate hidden sources of saturated fatty acids. Collect a variety of labels or boxes of food with nutrition information on the label. Categorize into groups of low fat, moderate fat and high fat sources. Ask groups to analyze by using both nutrition information and ingredient listing on the label.
2. Have pictures from magazines, food models or food containers from each food group. Ask two or three participants to arrange them in a good example of a fat/cholesterol-restricted meal. They should explain why they made certain choices. What changes could be made to make these foods even lower in fat/cholesterol?
3. Materials needed for demonstration activity three are:
 - Foods listed on page 5 under "What Is a Serving?"
 - 1 pound package of hamburger meat
 - Waxed paper
 - Four saucers or small plates
 - Newsprint or posters, markers
 - Empty containers of other foods to demonstrate serving sizes, deck of cards and food models from "A Change of Plate"
 - Measuring cups and spoons plus different sizes of glasses and cups

Demonstrate serving sizes of meat. Have a 1-pound package of hamburger meat. Divide it into four 4-ounce servings as follows:

- Flat, thin but wide patty
- Thick, round but narrow patty
- Large meat balls (2)
- Small meat balls (4 or 5)

Place each 4-ounce serving of meat on a saucer or small plate covered with waxed paper. Do not tell the participants that these are each 4-ounce (raw) or 3-ounce (cooked) patties. Explain that fresh, raw meat shrinks while cooking as moisture and some fat are lost. A pound of hamburger shrinks to about 12 ounces when cooked. Ask for volunteer to decide which is the largest serving? Smallest serving?

Demonstrate serving sizes of other food groups using different cup sizes, or measuring spoons for liquids, measuring spoons for gravies or sauces, slices of bread or pieces of rolls and sizes of cartons or cups for milk.

Have newsprint and marker to record food category and recommended serving sizes as you discuss them in the lesson plan.

The standard recommended serving size for meat, poultry and fish is 2 to 3 ounces. The dietary recommendations for meat is to eat two 3-ounce servings from the meat group per day to maintain a well-balanced diet; men generally exceed this amount per serving. Some variation exists in serving size according to the product, with the average serving size for beef at about 4 ounces, and 2 ounces for pork. When measuring meats, use size in ounces. You saw today that it makes a difference whether meat was cooked or raw when measured. Emphasize that judging ounces by sight can be difficult without the use of a scale, food models or a deck of cards to estimate the size or thickness.

4. Select a lean meat recipe for beef, pork or lamb from the National Live Stock and Meat Board or from your local county Extension agent (home economics).

Agents either demonstrate or invite a local commodity group member to provide a demonstration on the preparation techniques of lean meat to a leader training meeting. Encourage her to use lean meat bulletins or recipes for the meat preparation demonstration. Emphasize the use of lean meat trimmed of all fat prior to cooking. Lean meat kabobs would be a good choice. Discuss helpful hints for preparing lean meat when cooking outside. For the demonstration, all participants can help in

the preparation of their own mini kabob after the leader has demonstrated how to make the first kabobs. An outdoor grill, grill on stove or hibachi can be used for preparation. Some leaders may have outdoor gas grills. As you prepare the lean kabobs, introduced to us by the Chinese, you could discuss the history of Orientals who settled in the United States and their culture.

Another method used by the Chinese is a technique that evolved out of necessity, influenced by economic and cultural forces prevailing in China years ago. Scarcity of fuel and the Chinese desire for a harmonious balance of flavors, colors and textures at each meal led to rapid cooking over high heat, or stir-frying.

Basically, stir-frying is a method of cooking slivered or diced meat, fish or poultry and vegetables over very high heat in a minimum of hot oil, or in a nonstick skillet, to keep cooking light and calories down. Ingredients are stirred and lifted constantly as they cook. (Refer to a lean meat bulletin. You might want to have a wok to show equipment as you explain the method of preparation. Or, if a commodity group member gave a demonstration, refer to the procedure.)

Discuss how these preparation techniques add less fat and cholesterol to the meat.

In addition to stir-frying, lean meat strips can be prepared in a hurry by:

- Pan-broiling—differs from stir-frying in that no fat or water is added to the hot skillet.
- Broiling—marinated lean meat strips are placed on an outdoor grill and browned on each side over mesquite or charcoal.

As lean meat cooks, water and fat cook out of the meat. If you start with a piece of meat that does not contain much fat, such as a well-trimmed piece of top round, do not overcook or you will lose the juiciness that is characteristic of lean meat. Cook to rare, or not past medium, to prevent a dry texture. Place the meat on a preheated broiler, hot skillet or hot coals, so the exterior browns quickly, holding in the juices.

Leaner cuts of beef have less fat trim or plate waste. The quality of leaner lean meat is not affected when more fat is trimmed.

Examples of lean beef cuts with little visible fat are:

- Flank steak
- Chuck top blade steak
- Top sirloin steak
- Beef tenderloin steak
- Bottom sirloin (ball tip)
- Round tip roast (cap off)
- Top round steak
- Bottom round roast

What are examples of lean pork cuts? Lean lamb cuts? Show a variety of lean fresh cuts or pictures from magazines or obtain a variety of lean cuts from a local market.

5. Have a display of several lean cuts of beef in original retail packages. Buy three or four sirloin steaks with different degrees of marbling. Ask participants to rank the sirloins in order from one to four as a product that today's consumer would select.

Check with a meat market manager on how health-conscious consumer demands have affected the product he is now providing as compared to 20 years ago. Report this to the group.

Also discuss that the National Consumer Retail Beef Study was a beef industry research program supported by government, producers, feeders, packers and retailers. The Texas Agricultural Experiment Station, Texas A&M University, conducted the study by talking to consumers in Philadelphia, Kansas City, San Francisco and Houston during 1986.

Results of this research revealed that consumers:

- Want leaner beef
- Want less trimmable fat
- Will pay more for leaner cuts
- Look for a more convenient product
- Want little preparation time

They connect "leanness" with trimmable fat rather than marbling or fat in the muscle. Consumers interviewed did not wish to

purchase beef with outside fat in excess of 0.3 inch (show retail packages). They resisted purchasing retail cuts with 0.5 inch of outside fat. Consumers said that they are willing to pay a slightly higher price per pound for improved trimness. Also, consumers are looking for a convenient product requiring a minimum of preparation time.

Well ahead of the meeting, check with local grocery stores, supermarkets or meat markets to see if lean meat products are available; which of the supermarkets are using Meat Nutri-Facts; and what types of beef local consumers are demanding. Share the results of your preliminary survey of the local meat market with the group. Give the amount of cholesterol and fat content in lean cooked meats on the handout, "Specific Amounts of Fat, Cholesterol and Sodium in Lean Meats."

6. Show the newspaper or magazine article about saturated fatty acids, the bar graph on coconut and palm oil (Figure 2) and food labels containing fats. Have participants bring to the meeting a recent new article about saturated fatty acids and cholesterol from a newspaper, magazine, trade journal or other source. Have participants discuss types of fatty acids in foods and show fats high in saturated fatty acids.

Have them discuss an article they found in a national newspaper and explain why these two fats got such negative remarks in the press. Make comparisons with these oils/fats, beef and pork fats and the lean muscle in these meats.

What conclusions can be drawn to the types of fatty acids in fats and oils and lean muscles?

Based on recommendations made in the National Dietary Guidelines, what advice would you give to a person who needs to reduce cholesterol and fats in the diet? What fat sources should he/she select? What remarks would you make to someone who claims that to reduce the fat/cholesterol in the diet, all meats must be avoided?

7. You have been invited to be a guest editor for the "Cooking Light" magazine. The focus of your article will be on lower-fat preparation of lean meats. Your challenge

is to write an interesting article on reductions of fat/cholesterol and to create your own suggestions for fat reductions in the article. Write your article. To obtain some ideas on presenting this information in your article, look through several of the light-cooking bulletins from various commodity groups (such as National Live Stock and Meat Board), national magazines and diet cookbooks (such as Weight Watchers[®], American Heart Association, etc.).

When the article is completed, present it to the group and even submit it to a magazine or the local newspaper for publication.

8. Have several menus from restaurants and fast food establishments and a list of heart-healthy choices from local cafeterias.
 - Ask participants to look on the menus for foods with less fat that are steamed, roasted, poached, broiled or fresh rather than fried, creamed, breaded, crispy or basted with butter or fat. (List choices for each of these types of eating places on board or paper.)
 - Have participants suggest how to reduce fat in a sandwich, salad or entree when ordering in a restaurant.
 - If pastas, rice or other bread products are served with meats, such as a lean beef croissant sandwich or sausage biscuit, how might fats/cholesterol be reduced?
 - Have participants discuss serving size of meat entrees to reduce fat/cholesterol. (Note: One serving of meat cooked the size and thickness of a deck of cards is about 3 ounces.)
 - When selecting choices from the salad bar at a restaurant, what selections should be made to reduce fat/cholesterol?

After the discussion for eating out, have participants make personal choices for the next week using the Dietary Guidelines recommendations for the basic food group servings.

Write the foods on the board with yes and no columns after the foods as follows:

Foods	Yes	No
Luncheon meats	___	___
Low-fat luncheon meats	___	___
Hot dog, hamburger	___	___
Sausage, bacon or ribs	___	___
Fried chicken or fish	___	___
French fries or hash browns	___	___
Chips—potato or corn	___	___
Doughnuts, sweet rolls, croissants or biscuits	___	___
Sour cream, ice cream or whipped cream	___	___
Fried zucchini, okra or onion rings	___	___
Chicken-fried steak with gravy	___	___

Have participants make 11 lines and two columns for "Yes" and "No." Ask: Do you ever eat these foods listed on the board? If participants have more in "Yes" than in "No" columns, their diet is probably too high in fat and cholesterol.

9. Invite a registered dietitian, physician and exercise or physical education instructor to serve on a panel. Or inquire about a guest spot on a local television or radio show.

Ask each participant to prepare a question to ask panel members about the following:

- Dietary versus serum cholesterol
- Good versus bad cholesterol
- Effects of exercise on cholesterol levels
- Types of fats in foods and effects on cholesterol levels
- Maintaining healthy body weight
- Limiting of all dietary fat sources
- Risk factors in development of heart disease and how to reduce risk factors
- Hidden fat sources in foods
- More about foods that meet their nutritional needs and are low in fat and cholesterol
- How to increase their daily activity

After the panel discussion, participants should be able to discuss the best way to reduce cholesterol-rich foods and limit all sources of dietary fat.

Supplementary Resource Materials

For more information about reducing fat/cholesterol in your diet, order from the following sources:

**U.S. Department of Agriculture
Consumer Information Center
Department EE
Pueblo, CO 81009**

- Home and Garden Bulletin No. 232, "Dietary Guidelines for Americans"
- Miscellaneous Publication No. 1457, "Dietary Guidelines and Your Diet," Home Economics Teacher's Guide
- "Fats in Diet, No. 361"

**U.S. Department of Health
and Human Services
Public Health Service
Food & Drug Administration
5600 Fishers Lane
Rockville, MD 20857**

- DHHS (PHS) Publication 88-50211, "The Surgeon General's Report on Nutrition and Health," 1988
- NIH Publication No. 88-2928, "Blood Cholesterol Measurement in Clinical Laboratories," 1988
- NIH Publication No. 88-2920, "Eating to Lower Your High Blood Cholesterol," 1987
- NIH Publication No. 87-2922, "So You Have High Blood Cholesterol," 1987

**FDA Consumer
HFE-88
Rockville, MD 20857**

- FDA Consumer reprints related to fats and cholesterol in the diet.
- HHS Publication No. (FDA) 87-2220, "Planning a Diet for a Healthy Heart," 1987

**American Dietetic Association
216 West Jackson Boulevard
Suite 800
Chicago, IL 60606-6995**

- "Low-Fat Living—A Guide to Enjoying a Healthy Diet"
- "The Cholesterol Countdown—1, 2, 3"

**American Heart Association
7320 Greenville Avenue
Dallas, TX 75231**

- The American Heart Association Diet—An Eating Plan for Healthy Americans, No. 51-018-B (SA)
- Recipe for Fat—Controlled Low Cholesterol Meals, No. 50-020-B
- Dining Out—A Guide to Restaurant Dining, No. 50-067-A
- "The Culinary Heart Kitchen Course," 1985

**National Heart, Lung, and Blood Institute
of the National Institutes of Health
Information Center
4733 Bethesda Avenue
Suite 530
Bethesda, MD 20814**

- NHLBI Free Kit '89 is an integrated resource packet to help program planners develop creative health promotion/risk reduction activities for risk factors (smoking, high blood pressure and high blood cholesterol)

**American Meat Institute
P. O. Box 3556
Washington, DC 20007
(703)841-2400**

- "Fat Facts"
- "What's in the Meat We Eat?"

National Live Stock and Meat Board
444 North Michigan Avenue
Chicago, IL 60611

- "Exploring Meat and Health"
- "Meat and Poultry Labels Wrap It Up—With What You Need to Know"
- "A Change of Plate" chart and food models
- "Eat Light with Beef"
- "Light Cooking with Beef"
- "The Lighter Side of Beef"
- "Meat Nutri-Facts" related to Beef, Pork and Lamb
- "Lean and Light Lamb" Recipes
- "Low-Calorie Cooking with Lamb"
- "Announcing Some New Findings on Cholesterol" brochure

Texas Beef Industry Council
8310 Capital of Texas Highway North
Suite 440
Austin, TX 78731
(512)345-3531

- "A Guide to Heart-Healthy Eating"
- "On the Trail of Hidden Fat—The Detective Goodheart"

AUDIOVISUALS

National Cattlemen's Association
P. O. Box 3469
Englewood, CO 80155

- "The Story of Modern Beef," (videotape)

Iowa Beef Industry Council
P. O. Box 451
Ames, IA 50010
(515)232-0428

- "The Red Meat and Health Program," 1/2 inch or 3/4 inch VHS, \$39.95

Evaluation Instrument

Evaluation of the concepts learned through participating in Unit 2 can be accomplished by use of pre-post test(s). At the first meeting, ask participants to complete "Evaluate Your Fat and Cholesterol Knowledge," "Fats in the Diet Evaluation" and "Test Your Fat and Cholesterol IQ." Keep the results of the tests until the completion of series.

In approximately 6 weeks, ask volunteers on your planning committee to take a representative sample of names on the registration list. Then call and ask the participants the enclosed questions from the quiz to see if the concepts taught have been retained. This will provide data concerning what participants have learned and retained about this unit.

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Unit 3. Meat Nutrition—Sodium in the Diet

Contents

	Page
Objectives	58
Concepts	58
Background Information	59
• Diet-Health Issues of Sodium	59
• Excessive Dietary Sodium	59
• Sodium in Foods	60
• Sodium in Fresh/Processed Meats	60
• Sodium in Processed Foods	60
• Dietary Reduction of Sodium	61
Leader Lesson Plan	62
• Advance Preparation Guide	63
• Presentation Guide	63
Handouts	70
• Evaluate Your Sodium Sense	
• Heart-Healthy Herb and Spice Blends	
• Form for Rating Heart-Healthy Meat Patties	
• Look for the Sodium in Fresh/Processed Meats	
• The Sodium Countdown	
• Group Discussion Sheet—Clues for Avoiding Too Much Sodium When Selecting Lean Meats	
• When in Doubt, Learn to Leave Sodium Out!	
• Sodium-Free Seasonings for Meat	
• Grocery Store Label Check Activity	
Suggested Learning Experiences	71
Supplementary Resource Materials	73
Evaluation Instrument	74
References	75

Unit 3. Meat Nutrition—Sodium in the Diet

Objectives

After completion of this lesson, consumers will be able to:

- 1 Identify sodium as an important nutrient in the body.
- 2 List the key risk factors for high blood pressure and other diseases.
- 3 Explain that excess sodium in the diet can aggravate existing high blood pressure.
- 4 Name food sources of sodium and the difference in sodium levels in fresh and processed meats.
- 5 Demonstrate ways to detect sodium by reading food labels.
- 6 Describe how to reduce sodium intake through wise selection of two 3-ounce (cooked) servings of fresh, lean meat group foods (meat, fish, poultry or meat alternates) daily.
- 7 Show how to modify recipes to reduce sodium consumption.

Concepts

- 1 Dietary sodium is necessary for bodily functions.
- 2 About one in four Americans has elevated blood pressure.
- 3 High blood pressure increases the risk of heart disease, stroke and kidney disease.
- 4 Sodium intake is associated with hypertension and other diseases. Frequently, hypertension and obesity co-exist.
- 5 Fresh meats provide little sodium, containing less than 100mg per 3-ounce serving.
- 6 Processed meats and other processed foods are significant sources of sodium.
- 7 Nutrition and ingredient labels on processed foods and processed meat products can show the major sources of sodium in food. Reading this information on labels is essential for the person interested in reducing total sodium content of the diet.
- 8 To reduce consumption of sodium, select more fresh, lean meat sources and cook by methods that do not add extra sodium.

Background Information

Diet-Health Issues of Sodium

Sodium is an essential mineral that has many important functions in the body. The main function of sodium, along with potassium, is the regulation of body fluids. Every cell in the body is surrounded by water which contains nutrients and other substances essential for proper functioning. In the normal adult, 63 percent of the sodium in the body is present in the fluids outside the cells, 11 percent is within the cells and the rest is in the bones. Ninety-five percent of the potassium is within the cells. The ratio of sodium in the fluids between the cells to potassium within the cells is important for proper body functioning. The normal body retains enough water to keep sodium at the proper concentration. Sodium plays a major role in maintaining blood volume and blood pressure by attracting and holding water in the blood vessels. Also, sodium and potassium help maintain the acid/base balance in the body. They are a part of the buffering systems which help regulate the pH or the acid/base level of body fluids. In addition, both minerals are needed for transmission of nerve impulses—for muscles to contract and for the heart to beat.

The amount of water your body retains is directly related to the sodium it retains. Under normal conditions, as the body loses sodium it loses water and as it retains sodium, it holds water. In this way, your body maintains the proper concentration of sodium and level of body fluids.

Normally, the kidneys eliminate excess sodium through the urine. However, in certain disease states, excess sodium is not excreted but stays in the body and holds water. Retaining more fluid leads to a narrowing effect of the arteries/blood vessels. Excess blood volume causes the heart to work harder to pump blood through the body and high blood pressure can result. People who have diseases that cause sodium to be retained also have fluid retention, which leads to swelling (edema). Kidney disease and liver disease usually cause sodium retention and water retention, sometimes to a marked degree. Sodium and water retention may cause heart failure. As the fluid accumulates, breathing becomes more difficult. Certain changes in body functions, such as premenstrual hormone changes, stimulate sodium retention, accompanied by fluid retention.

Excessive Dietary Sodium

Dietary Guidelines for Sodium

For some people, too much sodium may be a risk factor or increase the chance of developing high blood pressure. However, the main concern is for those who already have hypertension. Having high blood pressure increases the risk of heart attacks, strokes and kidney disease. Health and government organizations and public policy groups have made dietary recommendations for reducing sodium in the diet to the general public in an effort to help alleviate the symptoms of this disease. (Refer to "Comparison of Dietary Guidelines" in Unit 2 for sodium recommendations from various health organizations.)

In the chart, note the recommendations from the various health and public policy organizations for reducing sodium. The USDA/DHHS recommends avoidance of too much sodium; the AHA suggests a reduction in dietary sodium intake; the ACS and the NRC-NAS both advise minimizing consumption of food preserved by salt curing, salt pickling or smoking.

For example, the Surgeon General's Report on Nutrition and Health (1988) states: "High blood pressure (hypertension) is a major risk factor for both heart disease and stroke. Almost 58 million people in the United States have hypertension, including 39 million who are under age 65. The occurrence increases with age and is higher for black Americans (of which 38 percent are hypertensive) than for white Americans (29 percent)."

Approximately 60 million Americans have high blood pressure. Some 95 percent of these Americans have "essential" hypertension which means there is an unknown cause for their high blood pressure. Hypertension may be of primary origin or secondary to some other disease. To control the symptoms of the disease, the following practices should be followed: medication as prescribed by the physician, education, weight control, sodium restriction, increased potassium, exercise, relaxation and control of lifestyle.

Sodium in Foods

Common table salt, 40 percent sodium, is used widely in the preservation, processing and preparation of foods. One teaspoon of salt contains approximately 2,000mg of sodium. As you read in Unit 1, sodium is necessary for normal body functions. Sodium is consumed in the range of 4,000 to 6,000mg daily (2 to 3 teaspoons) in the United States today. This is higher than the 1,100 to 3,300mg per day found to be safe and adequate by the National Research Council.

People cannot avoid sodium altogether because it is naturally present in many foods. Foods themselves add half or less to the total sodium content of the American diet. Processed foods contribute about one-third to the total sodium content of the diet. Salt added at the table, in cooking or drinking water causes a sodium excess most often. Some food groups such as milk group foods provide essential nutrients plus significant amounts of sodium. But consuming less than recommended amounts of milk and other dairy products is not a good way to reduce sodium in your diet. It may inadvertently decrease calcium intake. Recent research has indicated that increasing the amount of dietary calcium may protect against hypertension for those at risk to the development of this condition. And, for those with known hypertension, eating enough calcium may help lower blood pressure. Calcium helps to relax the cells in the blood vessels, and to maintain normal tone, stability and functioning of the circulation system. The best method of reducing sodium without affecting the intake of other essential nutrients is to avoid salty food.

Sodium in Fresh/Processed Meats

Most of the meat and poultry purchased by consumers is fresh, without added sodium, and contains less than 60mg of sodium per 3-ounce serving. Processed or cured meat products (sausages, luncheon meat, frankfurters and canned meats) are much higher (75 to 1,350mg per 3-ounce serving). Sodium chloride attracts protein to bind the lipids, minute particles in suspension, which gives such products their characteristic structure and texture. Heat treatment prevents the growth of harmful organisms (such as those which cause botulism) during storage of these cured products.

According to Food and Drug Administration (FDA) research, meats, fish and poultry collectively contribute about 14 percent of the sodium to the diet of adults (Sodium in Foods Council on Scientific Affairs, 1983). Along with research on processed meat products to reduce saturated fatty acids and cholesterol, the American Meat Institute has initiated research at a number of universities designed to reduce sodium content in processed meats such as bacon, ham and sausage without reducing product stability or consumer acceptance. Some sausage products, soy products, cereals or milk may contribute as much as 10 percent of the sodium. These are added to lower the cost of the product or to add characteristic texture/flavor (i.e., loaf-type products) but can result in increased sodium.

Sodium in Processed Foods

Salt has been used for centuries for food preservation. It is excellent in preventing bacterial growth—so, read the label of processed food to determine how much sodium is present. Other food additives that contain sodium are as follows:

- Monosodium glutamate
- Sodium tripolyphosphate
- Sodium bicarbonate
- Sodium saccharin
- Brine (salt solution)
- Sodium benzoate
- Sodium propionate
- Sodium hydroxide
- Disodium phosphate

When you shop, look for sodium on the food label of processed meats. Starting in July 1986, manufacturers were required to include sodium content, printed on the labels of all processed foods giving nutrition information. More than half of all processed foods—the non-meat and non-poultry items FDA regulates—must list the amount of sodium they contain. The amount of sodium is always stated in mg per serving to the nearest 5mg. The sodium value listed on such labels includes the sodium in the raw ingredients as well as those added during food processing.

The Food and Drug Administration also has established definitions and guidelines for the terms "sodium free," "very low sodium," "low sodium," and "reduced sodium" (see chart). Some manufacturers voluntarily list sodium content on labels per container as shown:

Sodium Labeling Terms

Sodium free	contains less than 5mg sodium
Very low sodium	contains less than 35mg sodium
Low sodium	contains less than 140 mg sodium
Reduced sodium	must be 75 percent less than in the product it is designed to replace
No added salt	the food that it resembles is unsalted
Without salt added	normally processed with salt

In Unit 1, the Meat Nutri-Facts Program was described as a means to assist consumers in making informed decisions at the meat case, which include having lean meat in a healthy diet. Although the Meat Nutri-Facts information is not provided on each label, a display is usually provided on the supermarket shelf with information about nutrition, basic cookery, meat storage and handling.

The sodium standard from the Food and Nutrition Board of the National Academy of Sciences (NAS) for sodium is from 1,100 to 3,300mg. According to the Meat Nutri-Facts Program information, a 3-ounce serving of cooked lean meat would contain 57mg of sodium; 2 percent of the NAS maximum of 3,300mg of sodium per day. The cured or processed product's sodium content is considered in the high category, however.

Dietary Reduction of Sodium

Consumers should select fresh, lean meat sources and lower sodium sources, rather than an excess of processed foods and meats which provide about a third or more of dietary sodium plus increased saturated fatty acids. Consumers add at least a third of the sodium by adding salt at the table and/or adding spices such as

celery or garlic salt and condiments containing excess sodium.

To reduce sodium consumption:

- Use less salt at the table.
- Substitute alternative flavorings (such as spices, herbs and lemon juice) to salt-containing condiments (pickle relishes, soy sauce, olives, etc.) in preparing foods.
- Choose fresh, lean meats such as fresh pork instead of cured ham.
- Select less processed or cured meats or select only those lower in sodium. Reading labels helps you see the difference in sodium content between a salt cured country ham and hams cured by different processes.
- Baste lean meats with wine, seasoned vinegar or lemon juice instead of adding soy sauce or teriyaki sauce which contain high levels of sodium.
- Cook a day ahead when making meat soups, stews or sauces and use less salt. This gives the natural flavors of the food time to blend.
- If selecting processed meats such as frozen, canned or shelf-stable, read nutrition information on the label to determine what percentage of the sodium content is of the NAS recommendation. As a general rule, shelf-stable meats (foods designed for quick-cooking) and those intended for storage at temperatures higher than freezing usually contain more sodium than those that are frozen. However, frozen meats are usually higher in sodium than fresh meats.
- When eating in a restaurant or fast food establishment, check with restaurant to see if nutrition information about the food served is available. Many fast food restaurants make them available to consumers. Ask the waiter to request that no salt or sodium-containing condiments be added to the food ordered. Also, follow these general guidelines when ordering from a menu.

Leader Lesson Plan

Objectives

After completion of this section of the lesson, consumers will be able to:

1. Explain the role of sodium in maintaining blood pressure and volume.
2. List the key risk factors for high blood pressure and other diseases.
3. Explain that excess sodium in the diet can aggravate existing high blood pressure.
4. Name food sources of sodium and the difference in sodium levels in fresh and processed meats.
5. Demonstrate ways to detect sodium by reading food labels.
6. Describe how to reduce sodium intake through wise selection of two 3-ounce (cooked) servings of fresh, lean meat group foods (meat, fish, poultry and/or meat alternates) daily.
7. Describe some people who are at greater risk and must reduce sodium.
8. List the major considerations for overall dietary sodium reduction.
9. Demonstrate the basic techniques to reduce dietary sodium.

Key Concepts

1. Dietary sodium is necessary for body functions.
2. About one in four Americans has elevated blood pressure.
3. High blood pressure increases the risk for heart disease, stroke and kidney disease.
4. Sodium intake is associated with hypertension and other diseases. Frequently, hypertension and obesity co-exist.
5. Fresh meats provide little sodium, containing less than 100mg per 3-ounce serving.
6. Sodium is added to many foods to flavor, preserve, or add characteristic texture or qualities to certain products such as processed meats.
7. Processed meats and other processed foods are significant sources of sodium.
8. Nutrition and ingredient labels on processed foods and processed meat products can show the major sources of sodium in the food. Reading this information on labels is essential for the person interested in reducing total sodium content of the diet.
9. To reduce consumption of sodium, select more fresh, lean meat sources before cooking. Then, cook by methods that do not add extra sodium.

Leader Lesson Plan

Advance Preparation Guide

1. Review Unit 3, Meat Nutrition—Sodium in the Diet leaders' guide and lesson plans. Complete the activity prior to the meeting so you will better understand the subject matter and method of presenting it.
2. Review Home and Garden Bulletin No. 233, U.S. Department of Agriculture "The Sodium Content of Your Food." Order enough copies of the bulletin from the address on page 73 for all participants.
3. Review "Nutrition and Your Health—Dietary Guidelines for Americans," Home and Garden Bulletin No. 232, U.S. Department of Agriculture and U.S. Department of Health and Human Services.
4. Reproduce copies of the following handouts in sufficient quantities for the forthcoming group meeting.

- Evaluate Your Sodium Sense
- Heart-Healthy Herb and Spice Blends
- Form for Rating Heart-Healthy Meat Patties
- Look for the Sodium in Fresh/Processed Meats
- The Sodium Countdown
- Group Discussion Sheet—Clues for Avoiding Too Much Sodium When Selecting Lean Meats
- When in Doubt, Learn to Leave Sodium Out!
- Sodium-Free Seasonings for Meat
- Grocery Store Label Check Activity

5. Prior to meeting, prepare by broiling or pan-broiling four lean meat patties large enough to serve a small sample to each person. Cut in cubes or squares. Label samples one through four. Put toothpicks in each square and serve one to each participant. Provide and explain the "Form for Rating Heart-Healthy Meat Patties."

Prepare the recipes for the four salt-free herbs/spices contained in this packet. Let participants sample all of them and rate them according to taste, juiciness, etc. Also, let the participants guess what the spices/herbs are in each blend.

6. Additional materials:

- Newsprint, markers
- Bottles of spices that contain no sodium
- Waxed paper
- Toothpicks
- Labels for samples
- Paper plates or napkins
- Equipment to use in preparation of meat samples
- Chalkboard, chalk, newsprint or large sheets of paper, pen or marker
- Division of participants into groups

7. Decide which additional learning experiences you will use and assemble materials for each one.

8. Order the desired references from the supplemental resources list.

Presentation Guide

A. Diet-Health Issue of Sodium

Setting the Stage

HANDOUT: Have participants complete "Evaluate Your Sodium Sense" before you begin the lesson.

To get the audience's interest, handout and discuss "Heart-Healthy Herb and Spice Blends" to use in preparation of meats. Refer to the **Note** on the handout of the same name for recommended discussion as you show the various low-sodium herbs and spices for use in heart-healthy diets. Conduct the tasting panel and evaluation.

The Health Issue of Sodium
Almost 25 percent of Americans have elevated blood pressure. Because it often produces no symptoms, blood pressure

should be checked regularly for early diagnosis. High blood pressure (hypertension) increases the risk for heart attack, stroke and kidney disease.

Risk factors for developing high blood pressure include a family history of the disease, overweight and a high sodium intake. Some individuals can eat high-sodium diets without increased blood pressure; others cannot.

Sodium intake is associated with hypertension. Often, hypertension exists along with obesity—so that when weight loss occurs, hypertension also diminishes. Regular blood pressure checks indicate whether hypertension exists. Have your blood pressure checked if you do not know it.

Eating more sodium than you need may aggravate high blood pressure once it exists. Thus, limiting dietary sodium is often an important part of treatment, along with exercise, weight reduction (if appropriate) and medication.

It is not known who will develop high blood pressure, but we know that many Americans eat much more sodium than they actually need. Therefore, many health professionals believe that reducing sodium is sensible for the population as a whole.

Some four out of 10 adults are trying to cut down on salt or sodium intake. Consider reducing your sodium intake.

Teaching Steps

DISCUSS: On newsprint or chalkboard, write and discuss:

Salt-Sodium Conversions

- 1/4 tsp salt contains 500mg sodium
- 1/2 tsp salt contains 1,000mg sodium

- 3/4 tsp salt contains 1,500mg sodium
- 1 tsp salt contains 2,000mg sodium

The relationship of quantities of salt and sodium may be a little hard to understand at first. However, if you remember that 1 teaspoon of salt provides about 2,000mg of sodium, you can estimate the amount of sodium that you add to foods during cooking, preparation or at the table. At restaurants, ask the waiter to add no salt or sodium-containing condiments to your food.

HANDOUT: Have participants find words related to the sodium-diet/health connection by completing the "Look for the Sodium in Fresh/Processed Meats."

DISCUSS: Background information on "Diet-Health Issues of Sodium."

HANDOUT: Refer to copy of "Comparison of Dietary Guidelines Chart," handed out from Unit 2.

DISCUSS: Recommendations for dietary guidance for sodium intake from various health and governmental organizations.

REVIEW: Dietary Guidelines (H&GB232).

B. Sodium in Fresh/Processed Meats

Setting the Stage

Gain the audience's interest by discussing:

Sodium in Fresh/Processed Meats

Sodium, a mineral, occurs naturally in some foods and is added to many foods and beverages. Most of the sodium in the American diet comes from table salt, which is 40 percent sodium and 60 percent chloride. One teaspoon of salt contains about 2,000mg of sodium. But as you will see, simply taking the salt shaker off the table will not remove excess sodium from your diet.

Sodium is important because it attracts water into the blood vessels and helps maintain normal blood volume and blood pressure. Sodium is also needed for the normal function of nerves and muscles.

Some sodium is essential to your health but you need very little. According to the National Research Council of the National Academy of Sciences, a "safe and adequate" range of sodium intake per day is about 1,100 to 3,300mg for adults. That amount is well below the quantity that most American adults consume. The U.S. Dietary Guidelines for Americans recommends consumers avoid eating too much sodium.

Teaching Steps

DISCUSS: The amounts of sodium contained from various dietary sources. List on chalkboard or paper:

Sodium source	Amount per day
Cooking and table use	3,400mg
Natural component of food	3,000 to 4,000mg
Added during processing	6,400 to 7,400mg
Total Salt	10,000 to 12,000mg
Sodium (40 percent of total)	4,000 to 4,800mg

HANDOUT: "The Sodium Count-Down."
Have participants make suggestions for reducing sodium content.

DISCUSS: Sodium is found in many foods. It occurs naturally in most foods or is added during processing, cooking or at the table. Most sodium added during processing comes from salt, but other ingredients or additives used by manufacturers contain sodium as well. Salt follows sugar in amount added by manufactur-

ers to the foods Americans eat. (Refer to "Sodium Count-Down" handout.)

Foods that provide significant amounts of sodium (excluding sodium added during cooking or at the table) in Americans' diets include bread and bakery products, cured and processed meats, canned vegetables and milk products, especially many cheeses. Estimating the actual sodium content of diets is difficult because of the variable amounts of sodium people add to foods during cooking and at the table.

DISCUSS: Sodium in foods may be added at the table, at the supermarket or in the kitchen. Most of the sodium in processed foods is added to preserve or flavor them. Salt is the major source of sodium added to these foods and is added to most canned and some frozen vegetables, smoked and cured meats, pickles and sauerkraut. Salt is used in most cheeses, sauces, soups, salad dressings and in many breakfast cereals. Sodium also is found in many other ingredients used in food processing.

DISCUSS: (List on chalkboard or paper as participants name various additives that contain sodium.) Examples of sodium-containing ingredients and their uses in foods are:

- Baking powder—leavening agent
- Baking soda—leavening agent
- Monosodium glutamate—flavor enhancer
- Sodium benzoate—preservative
- Sodium caseinate—thickener and binder
- Sodium citrate—buffer, used to control acidity in soft drinks and fruit drinks

- Sodium nitrite—curing agent in meat, provides color, prevents growth of bacteria causing botulism (a food-borne illness)
- Sodium phosphate—emulsifier, stabilizer, buffer
- Sodium propionate—mold inhibitor
- Sodium saccharin—artificial sweetener

ASK: The group to list condiments high in sodium:

Onion salt	Soy sauce
Celery salt	Steak sauce
Garlic salt	Barbecue sauce
Seasoned salt	Prepared mustard
Catsup	Meat tenderizer
Bouillon	Worcestershire sauce
Baking powder	Salad dressings
Baking soda	Pickles
Monosodium glutamate (MSG)	Chili sauce
	Relish

HANDOUT: "A Group Discussion Sheet—Clues for Avoiding Sodium When Selecting Lean Meats." Divide participants into three groups. Ask each group to focus on one of three clues for discovering sodium sources in the diet. Report back to group.

DISCUSS: Nutrition and ingredient labels on foods can show you the major sources of sodium in your diet and help give you an idea of your sodium intake.

Nutrition labels are on many foods. Explain Meat Nutri-Facts for fresh meats and the sodium listed on the label of processed meats.

DISCUSS: Show labels from regular bacon vs. low-salt bacon. Discuss that sodium appears on nutrition information as well as ingredient listing.

Sodium Nutrition Listing
Sodium is given in milligrams (mg) per serving on nutrition labels. The amount includes

sodium naturally present in the ingredients as well as sodium added during processing.

Here is part of a nutrition label like those seen on foods. This label, for center cut bacon, gives information that the food provides 120mg of sodium in a 1 slice serving. Six slices would be 30g or approximately 1 ounce.

Nutrition Information (per serving/slice)

Serving size	5g
Servings per container	23 to 33
Calories	25
Protein	2g
Carbohydrate	less than 1g
Fat	2g
Sodium	120mg
(1,155mg per 100g 3 1/2-ounce serving)	

Ingredient labels are found on nearly all food products. Listed are the ingredients in the food by weight, from greatest to least. (See the sample below.) Salt is the major—but not the only—source of sodium in food products. Any ingredient that has sodium, salt or soda as part of its name (monosodium glutamate, baking soda, seasoned salt) contains sodium. Soy sauce and other condiments used as ingredients also contribute sodium.

Sodium on the ingredient label of center cut bacon:

- Ingredients: Cured with water, salt, sugar, sodium phosphates, sodium erythrobate, sodium nitrite.

The cured bacon contains four different sodium ingredients. Notice that salt is the second ingredient in the product by

weight. Therefore, this product is probably high in sodium. If there is a nutrition label, check to see if the amount of sodium in a serving is listed. If you need more specific information, write to the manufacturer.

Have labels from meats in a bowl. Let participants draw out labels and discuss the sodium-containing additives and their function in the product.

DISCUSS: Shopping tips when looking for reduced sodium, especially in reference to processed meats.

SHOW: Examples of processed meats and labels from packages, canned meats, frozen and fresh meats.

DISCUSS: Explain that many manufacturers are introducing processed meats with reduced sodium because some consumers want less sodium. Fresh meats are already reduced-sodium choices for consumers. Examples of types of food, often containing meat or used with meats, that are now available in low-sodium form or with reduced or no added salt, include the following foods:

- Ready-to-eat cereal
- Canned vegetables, vegetable juices and sauces
- Canned soups containing meats
- Dried soup mixes, bouillon
- Condiments
- Snack foods (chips, nuts and pretzels)
- Ready-to-eat pastas
- Bread, bakery products
- Butter, margarine
- Cheeses
- Processed meats

Look for reduced-sodium versions of these products where you shop.

DISCUSS: List sodium labeling terms in the background information on chalkboard or paper. (See background information related to this concept.) Ask participants to discuss what they can do to reduce sodium intake beyond reading product labels for sodium information.

C. Dietary Reduction of Sodium Encouraged

Setting the Stage

The two considerations of which everyone should be aware, in relation to sodium reduction in the diet, are as follows:

Consideration #1: You are probably getting more sodium than you need. The body needs some sodium necessary to attract and hold water in the blood vessels and to ensure that there is enough blood to carry oxygen and nutrients. Most Americans get several times the sodium needed daily.

Consideration #2: Try to include good sources of potassium in your daily diet. Fresh fruits, bananas, other fruits, vegetables and meats are a great source of potassium. Is that why you should eat more fruits and vegetables? Research recommends that you need about twice as much potassium every day as sodium. The 2 to 1 ratio helps to maintain healthy blood pressure.

Emphasize again that Dietary Guidelines recommend reducing sodium.

Teaching Steps

HANDOUT: "When in Doubt, Learn to Leave Sodium Out!" and "Sodium-Free Seasoning for Meat." (Discuss handouts.)

DISCUSS: Whether you are shopping for food, preparing it at home or eating out, choices must be

made if you want to lower your sodium intake. In the long run, cutting down may add up to better health.

DISCUSS: How to balance sodium in the diet. As you list ways to reduce sodium on the chalkboard or newsprint, refer to "The Sodium Countdown."

- At the table, always taste your food before salting. If salt must be added, try one shake instead of two. Watch the amount of prepared sauces or seasonings added. Instead, add lemon juice or vinegar for zest.
- In cooking, you can reduce the sodium content of meals by balancing the sodium content of the various parts of the meal or the whole day's menus. For example, if you are eating a high-sodium main dish, select low-sodium side dishes. If you plan a high-sodium breakfast, eat a lower-sodium lunch or dinner.

Start by eating less sodium. You can cut back on your taste for salt gradually. People are not born with a preference for salt, and it can be "unlearned."

- When menu planning, select more unprocessed foods because they usually contain less sodium than processed foods. In home-prepared foods, you can vary the amount of salt you add. Consider the sodium amount of all the ingredients in a recipe. For instance, if you use cured meat, dehydrated or canned soup, cheese or canned vegetables in a dish, then try not adding any salt.

Look for seasonings and sauces with less sodium, or use lemon juice, spices or herbs—such as onion or garlic powder (not onion or garlic salt), paprika, pepper, curry or dill—for flavor.

- When dining out, eat foods without sauces, or ask for sauce "on the side" so you can eat less, particularly if it tastes salty. In restaurants, request that no additional salt be added to

your food when prepared in the kitchen. Order fresh lean meats, either broiled or grilled, rather than breaded and fried fresh meats or cured varieties. Balance the sodium content of your meal when ordering, just as you would at home. Avoid adding bacon, cheese, pickles, olives or relishes to your salads or vegetables.

- When eating fast foods, some good news is that more and more restaurants are providing nutrition information—including fat and dietary cholesterol and sodium content—for foods on their menus. Tell participants to ask the manager of their favorite fast-food place for any available information on the nutrient content of their foods. Discuss sodium content of several fast-food choices.

DISCUSS: Shopping tips to select fresh, lean meats more often than processed meats. Relate how consumers can reduce sodium intake.

SUMMARIZE: When preparing meat dishes, note the following tips:

- Fresh, frozen and canned fruits and fruit juices contain less sodium than most canned vegetables, vegetable juices and frozen vegetables with sauce. Processed vegetables and fruits are high in sodium compared to fresh or frozen ones cooked without added salt. So, include more fresh vegetables instead of casseroles or meat dishes.
- One serving of low-fat or non-fat milk or yogurt is lower in sodium than most natural cheeses, which vary widely in their sodium content. Processed cheeses, cheese foods, and cheese spreads contain more sodium than natural cheese. Cottage cheese contains less sodium than processed cheeses but more sodium than natural cheese. Use foods with less sodium in meat dishes such as lasagna.
- Most fresh meats, poultry and fish are low in sodium in comparison to canned poultry and fish. Most cured

and processed meats such as wieners, sausage and luncheon meats are high in sodium content. Sodium is used during processing to preserve them.

- Convenience foods are quite high in sodium. Canned soups, frozen dinners and combination dishes, and dehydrated mixes for soups, sauces and salad dressings contain sodium. The condiments soy sauce, catsup, mustard, tartar sauce, chili sauce, pickles and olives are also high in sodium.
- Foods with low or reduced sodium are appearing on supermarket shelves as alternatives to those processed with salt and other sodium-containing ingredients. Check the labels for the sodium content of these foods.

DISCUSS: Cooking hints for reduced sodium in the diet.

POINT OUT: If you or members of your family have been placed on a sodium-restricted diet, make changes to reduced sodium in your diet when you:

- Shop
- Cook
- Eat

Select lean meats that can make a difference.

Handouts

- Evaluate Your Sodium Sense
- Heart-Healthy Herb and Spice Blends
- Form for Rating Heart-Healthy Meat Patties
- Look for the Sodium in Fresh/Processed Meats
- The Sodium Countdown
- Group Discussion Sheet—Clues for Avoiding Too Much Sodium When Selecting Lean Meats
- When in Doubt, Learn to Leave Sodium Out!
- Sodium-Free Seasonings for Meat
- Grocery Store Label Check Activity

Evaluate Your Sodium Sense

Code/Name _____

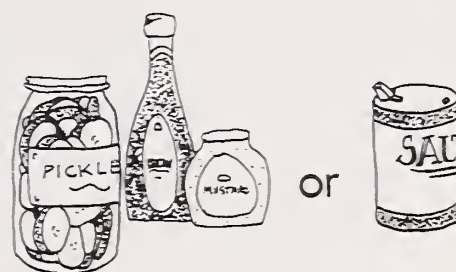
Telephone _____

Note to the Leader: After completing Unit 3, have participants take the quiz again to see how much they know about sodium content of the diet.

1. T F Sodium information is provided on nutrition labels of many foods.
2. T F One way to decrease your sodium intake is to use onion and garlic salt instead of table salt.
3. T F Many canned and commercially prepared meats have sodium added.
4. T F To reduce sodium, you can use condiments such as soy sauce, mustard, salad dressings, pickles and relishes instead of salt for flavoring foods.
5. T F Most of the foods in a given food group, such as milk and cheese, contain similar amounts of sodium.
6. T F Sodium may be added to processed meats as a preservative as well as a flavoring agent.
7. T F Salt substitutes are a good idea for everyone trying to reduce sodium intake.
8. T F You can always tell how much sodium a product contains by tasting it.
9. T F Preference for the taste of salt is learned, but can be changed with practice.
10. T F Many foods can be prepared with less salt with little effect on their acceptability.

Fill in the blanks:

11. _____ Which food has the most sodium?
 a. 3 ounces fresh, cooked, lean pork
 b. 3 ounces cured, cooked, lean pork
 c. 1 average dill pickle



12. _____ Among the above listed foods, which has the least sodium?

13. _____ How much salt does the average person eat daily?
 a. 1 to 3 teaspoons
 b. 1/4 teaspoon
 c. 4 to 6 teaspoons

continued on next page

Evaluate Your Sodium Sense, continued

14. _____ Sodium is _____ percent of table salt.
a. 20
b. 40
c. 60
15. _____ Adding salt to improve the flavor of food is learned early in life.
a. False
b. True
c. Neither a nor b
16. _____ The safe and adequate range of sodium intake per day is:
a. 200 to 300mg
b. 1,100 to 3,300mg
c. 4,000 to 6,000mg
17. _____ One teaspoon of salt contains _____ milligrams of sodium.
a. 1,500
b. 1,700
c. 2,000

Evaluate Your Sodium Sense Key: Unit 3

1. T
2. F
3. T
4. F
5. F
6. T
7. F
8. F
9. T
10. T
11. c
12. a
13. a
14. b
15. b
16. b
17. c

Heart-Healthy Herb and Spice Blends

In place of salt or salt blends (garlic, celery or onion salt which may add from 1,650 to 1,850mg of sodium per teaspoon), herb and spice blends add flavor variety to lean meats, fish, poultry or vegetables. Prepare the lean meats with the following:

Grind the following combinations in a blender for 1 minute at high speed or until powdery. Store in an airtight container.

Zippy Herb

1 1/2 tablespoons thyme
1 1/2 tablespoons marjoram
1 tablespoon rosemary leaves
2 teaspoons ground sage
1 teaspoon ground black pepper

Peppy Delight

1 teaspoon cloves
1 teaspoon ground black pepper
1 teaspoon ground coriander
2 teaspoons paprika
1 tablespoon rosemary

Salt-free Surprise

2 teaspoons garlic powder
1 teaspoon basil
1 teaspoon oregano
1 teaspoon powdered lemon rind
*Add rice to prevent caking.

Spicy Celery

1/2 cup instant chopped onion
1 tablespoon dill seed
1 1/2 teaspoons celery seed
1/2 teaspoon sugar
1/4 teaspoon tarragon

Ways to Break the Sodium Habit

Did you know that the taste for salt or sodium is a learned habit that can be unlearned? As you reduce your sodium intake, your taste buds will adjust and you will become more aware of the natural flavor of foods. By cutting back on sodium, many people have become more sensitive to the taste of sodium, so they prefer less salt on their foods.

Try adding less salt at the table and during cooking. Never add salt to your food before tasting it. Do you have a "salt habit?" Do you shake some salt on in the kitchen, then put more on at the table? To begin breaking the salt habit, try hiding the salt shaker. Replace the salt with a mixture of herbs and spices such as these that will please your palate without added sodium.

Note: Leader Instructions For Demonstrating Spice Blends
Have four lean meat patties (pork, lamb, veal or beef) just prepared on a broiler or pan-broiled, each flavored with one of the herb and spice blends and labeled with numbers from one to four. Use 1 1/2 teaspoons (or vary amounts to your taste). **NOTE:** If you use 2 teaspoons for Sample 1, then use 2 teaspoons for all samples. Have toothpicks available and small squares cut of each sample.

Distribute the "Form for Rating Heart-Healthy Meat Patties" rating form to participants. Explain the form and that each participant should rate the meat according to the sensory traits such as flavor, juiciness, etc. Ask participants to rate the flavor of the meats using the different spice blends. Discussion should follow on ways to break the sodium habit.

Prepared by Mary Kinney Bielamowicz, Ph.D., R.D., L.D., Extension Nutrition Specialist,
The Texas A&M University System, October, 1990.



Form for Rating Heart-Healthy Meat Patties

Name _____

Product _____

Date _____

Evaluate each sample for appearance first, aroma and then the remaining sensory traits of flavor, juiciness, texture, etc. Circle the number which most closely reflects your opinion; then comment below on any desirable or undesirable sensory trait.

Sensory Traits

Sample Number	Appearance	Aroma	Flavor	Texture	Juiciness	Bitterness	Overall Desirability
1	1 2 3	1 2 3	1 2 3	1 2 3	1 2 3	1 2 3	1 2 3
	4 5 6	4 5 6	4 5 6	4 5 6	4 5 6	4 5 6	4 5 6
2	1 2 3	1 2 3	1 2 3	1 2 3	1 2 3	1 2 3	1 2 3
	4 5 6	4 5 6	4 5 6	4 5 6	4 5 6	4 5 6	4 5 6
3	1 2 3	1 2 3	1 2 3	1 2 3	1 2 3	1 2 3	1 2 3
	4 5 6	4 5 6	4 5 6	4 5 6	4 5 6	4 5 6	4 5 6
4	1 2 3	1 2 3	1 2 3	1 2 3	1 2 3	1 2 3	1 2 3
	4 5 6	4 5 6	4 5 6	4 5 6	4 5 6	4 5 6	4 5 6

- 1. Very Undesirable
- 2. Moderately Undesirable
- 3. Slightly Undesirable

- 4. Slightly Desirable
- 5. Moderately Desirable
- 6. Very Desirable

In comparison to using salt at the table, which other flavorings for meats would you prepare and use in cooking? Sample 1, Sample 2, Sample 3 or Sample 4

Comments:

Prepared by Mary Kinney Bielamowicz, Ph.D., R.D., L.D., Extension Nutrition Specialist,
The Texas A&M University System, October, 1990.

NUTRITION

Look For The Sodium in Fresh/Processed Meats

The words hidden in the sliced ham are in **darkened** letters in these food rules. They relate to the sodium content of fresh and cured meats.

The 16 words (with one made of two words) you should find may be seen horizontally, vertically, or diagonally.

- **Fresh lean meats** are low in sodium.
- **Cured lean meats** are relatively high in sodium content.
- **Salt** contains 40 percent sodium and 60 percent chloride.
- **Bacon and hams** are pumped with brine.
- In today's market, meat processors are offering meat

products with reduced levels of sodium such as low-sodium bacon or sausage.

- High sodium intake increases the chance of developing high blood pressure (**hypertension**).
- Salt comes to your plate in three ways:
 - salt and **condiments** added at the table
 - sodium in **processed** food
 - sodium in **fresh** food.
- By using a variety of spices and herbs, one can reduce the desire for sodium.
- If you add 1/8 teaspoon of salt, you would increase the sodium content about 250 **milligrams**. One gram is equal to 1000 milligrams.
- The **Dietary Guidelines** recommend to: "Avoid too much sodium."

ЕЕСІДІЙЖКОРГЫЖІЛЕХСҒКР

UAIIEGEOXYZNXXCRASPEINDYLSF

TJGPAKRPCHLORIDEABAILORIDENP

DJUSELTVXOWBDIACEFGHLLNPSINKXZ

MF TVC TH T BRAS NT SNOOP SA ET N G D S T F R D O

AYGHLCORBSPEOAHSFNGERSAETNORBIGKS

QBTYIAIUUVWYXIZMMLISALGVICAEUEUCLO

OLOCANCLMENTOSREARIGERILORSCTIMTOE

SVWHESSSYPOCNERDILREDEOH SADROTP

LT AERS VAWANHEUSGRNGRATHERRESTEUE

KMIEDULUNO IETPIELBCKROAYLINGSIEN

SISCRVTS COE CRABLI SAOLIL CIVITISOECH

RXTN1SNASTUOEPLPIAERXINI SNEXOOMZ

ESRRBTBGWUCNPGRIIMNKLBZABRDXNFNP

RTYCEREESTYLMMBUYBXSANIPACDOKOX

SUHSEREGSKMPHLDADIMURYYTDOUIN'TPVST

XEAKKITSHENDRERIDOPLOEPMPTMO

DI BRIDEGIYOAREGBORCOOINE SDEWY

SKTDONPRPIEMGADSEIIMONWTOR

WXZUEECOI DMDGG I EBPCTGVCS

RUPDKRPSDDENAPPESTDM7

NAME: _____

Prepared by Mary Kinney Bielamowicz, Ph.D., R.D., L.D., Extension Nutrition Specialist,
The Texas A&M University System, October, 1990.

The Sodium Countdown

Avoiding sodium in obvious sources such as salted nuts or salting foods at the table isn't all that difficult. But what about those "hidden" sources that you might fail to count? Use the following table to determine relative amounts of sodium in meat group foods and those foods commonly combined with meat group foods.

Sodium			Sodium		
Food Product	Size	Content	Food Product	Size	Content
		mg			mg
Fruits, Fruit Juices			Fish		
fresh, frozen, canned	1/2 cup	8	fin (shellfish is higher)	1 ounce	15 to 25
			canned	1 ounce	90 to 150
Vegetables			Convenience foods*		
fresh, frozen,	1/2 cup	35 or less	pot pies	8 ounces	800 to 1400
canned or with sauce	1/2 cup	140 to 460	ravioli, canned	8 ounces	800 to 1400
Pasta, cooked			pizza	2-3 slices	800 to 1400
without salt	1/2 cup	5 or less	soups	1 cup	800 to 1300
			(canned/dehydrated)		
Bread*	1 slice	110 to 150	Snack foods		
Crackers*	2 or 3	110 to 150	nuts, unsalted	1 ounce	5
			nuts, salted	1 ounce	150 to 300
Milk, plain	1 cup	125	potato chips	14 chips	150 to 300
			corn chips	14 chips	150 to 300
Cheese*			Sauces, Seasonings,		
natural	1 ounce	75 to 300	Specialty Foods		
processed/cheese food	1 ounce	350 to 450	soy sauce	1 tablespoon	1,000
creamed/low-fat cottage			catsup, steak sauce,	1 tablespoon	125 to 275
cheese	1/2 cup	450	tartar sauce, chili		
Eggs			sauce, Worcestershire™		
	1	60	sauce, mustard		
Meat			pickles		
fresh	1 ounce	15 to 25	dill	1 average	928
sausage*	1 ounce	250 to 450	small sweet	1 average	125
luncheon meats*	1 ounce	250 to 450	pickle relish	1 tablespoon	100 to 125
frankfurters*	1 ounce	250 to 450	olives, ripe black	3	100 to 125
bacon, cooked	1 slice	65 to 170	Butter, Cream, Oils		
ham*	1 ounce	250 to 450	unsalted		
			butter/margarine	1 teaspoon	1
Poultry			salted butter/margarine	1 teaspoon	45
fresh	1 ounce	15 to 25	creams, including		
canned	1 ounce	90 to 150	sour cream	1 tablespoon	6
			powdered, imitation		
			creams	1 tablespoon	12
			vegetable oil	1 tablespoon	0
			prepared salad dressing	1 tablespoon	100 to 250

*Asterisked items were found to be among the top contributors to sodium in the American diet. This is based not on their sodium content alone, but also on their popularity and the frequency with which they are eaten. (HHS survey data, 1976-1980.)

Resource: "Sodium Count-Down." 1986. Food News for Consumers. U.S. Department of Agriculture, Washington, DC. Adopted by Mary Kinney Bielamowicz, October, 1990.





Group Discussion Sheet

Clues for Avoiding Too Much Sodium When Selecting Lean Meats

CLUE 1. At the Table—

CLUE 2. At the Supermarket—

CLUE 3. In the Kitchen—

CLUE 4. In Restaurants—



NUTRITION

When in Doubt, Learn to Leave Sodium Out!

Preparation suggestions for reducing sodium in lean meats and lean meat casseroles are as follows:

- Use suggested herbs and spices on the "Sodium-Free Seasonings for Meat" chart before adding to meat sauces.
- Bake roasts or meat loaves using cranberry sauce, jelly or marmalade glazes.
- Marinate lamb, beef, pork or veal with lemon pepper, lemon juice, parsley and a hint of tarragon, or baste with white wine.
- Cook vegetables, rice or pasta in unsalted water.
- Try seasoning with spices and herbs instead.
- Reduce salt in recipes to one-half or less.
- Substitute skim milk-based white sauce for cream sauces and canned soups in meat casseroles.
- Use homemade soup recipes instead of using canned ones.
- Use fresh, frozen or no-salt-added canned vegetables to thicken casseroles and soups. Avoid using frozen or canned main dishes or meals.
- For seasoning, use herbs, spices, vinegar, fruit juices, flavoring extracts, fruit peel or chopped vegetables rather than salt, seasoned salts, monosodium glutamate (MSG) or soy sauce. And, use no-added-salt "low sodium" vegetable or tomato juice to add flavor to soups and stews.
- Use low-sodium cheeses in meat casseroles.
- Add only "no-salt-added" fresh or frozen vegetables to meat casseroles. Drain and/or rinse canned vegetables to reduce sodium content.
- Add a rich flavor to stews or casseroles by adding 1 to 2 tablespoons of juice concentrate.
- Add only soup stock instead of salty bouillon when preparing homemade soups. Then flavor with one of the allowed herbs or spices.
- Mix low-sodium soy sauce with equal portions of pineapple, orange or cranberry juice for basting lean meats.



Sodium-Free Seasonings for Meat

Form of meat	Spices	Recommended amounts
Ground	Allspice	1/2 to 2 tsp per pound
Stew meat	Bay leaf, dried	1 to 2 leaves
Ground	Basil, dried	1 1/2 tsp per 1 1/2 pounds
Ground	Cinnamon	1/4 to 1/3 tsp per pound
Ground	Chili powder, without salt	1 to 2 tbsp per pound
Ground	Cayenne	1/2 to 1 tsp per 2 pounds
Ground	Coriander	1/2 tsp per pound
Chops, steaks	Curry	1 to 2 tbsp per 2 pounds
Ground	Cumin	1/4 tsp per pound
Roasts	Garlic, fresh	cut slits and/or bury pod in meat
Chops, steaks	Garlic, fresh	rub surface
Ground or chops	Garlic, powder	1/4 tsp per 1/4 cup basting
Ground	Ginger, ground	1/8 tsp
Ground	Mace	1/8 tsp per pound
Ground	Marjoram	1/2 to 1 tsp per pound
Ground or chops	Mint	1/4 tsp per pound or mint jelly
Ground	Mustard, dried	1/2 tsp per pound
Ground	Pepper	1/2 tsp per pound
Ground	Nutmeg	1/8 tsp per 1 pound
Ground	Oregano, dried	2 tsp per pound
Chops, steaks	Paprika (for dredging)	1/2 tsp to 1/4 cup flour
Ground	Parsley (flakes)	2 tbsp per 2 pounds
Steaks, chops (lamb)	Rosemary	1/4 tsp per pound
Steaks, chops	Tarragon	1/4 to 1/2 tsp to basting
Chops, steaks	Thyme (for dredging)	1/4 to 1/2 tsp to flour

Avoid overuse of the following sodium-containing seasonings with meat:

anchovies	olives (green)
bacon	pickles (sweet and dill)
baking powder	relishes
baking soda	commercial salad dressings
barbecue sauce	sauerkraut
bouillon cubes	salt (plain or seasoned)
catsup	commercial soup or sauce mixes
chili sauce	teriyaki sauce
tomato sauce (regular)	commercial horseradish
MSG (monosodium glutamate)	Worcestershire sauce
mustard (prepared)	mayonnaise



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tomato sauce (regular)	commercial horseradish
MSG (monosodium glutamate)	Worcestershire sauce
mustard (prepared)	mayonnaise

Grocery Store Label Check Activity

Food	Check	Brand(s)
Staples		
Bouillon		
Bread		
Potatoes, instant		
Pastas		
Rice		
Pizza crust		
Packaged Foods		
Skillet dinners		
• Lasagna		
• Meat/noodles		
• Meat/rice		
• Chinese dinner		
• Taco dinner		
Sauce, gravy		
Soup mixes		
Canned Foods		
Meat soups		
Tomato paste		
Tomato sauce		
Vegetables		
Vegetable juice		
Condiments		
Barbecue sauce		
Catsup		
Mayonnaise		
Prepared mustard		
Dairy Products		
Butter		
Margarine		
Cheese		
Milk		



Prepared by Mary Kinney Bielowicz, Ph.D., R.D., L.D., Extension Nutrition Specialist,
The Texas A&M University System, October 1990.

Suggested Learning Experiences

1. Explain that research has shown that there was a higher incidence of heart disease detected in those who customarily salt food before tasting when compared to those who either never salted food at the table or tasted food before salting it.

To estimate daily sodium consumed, have a plate covered with waxed paper. Remove paper to collect excess salt. Salt as if you were salting a plate with foods. Collect salt and measure it. Then figure how much sodium you consumed. Refer to the equivalent:

1/4 tsp salt contains 500mg sodium

Then have participants show how much salt provides 6,000, 4,000 and 2,000mg of sodium. Have clear bottles or glasses to show the different amounts of salt.

2. Have participants find the recipe for a meat stew or soup in a cookbook. Have them write the recipe and modify the sodium content so that no salt is added. Also, have them look up the sodium content of each food so they can make a comparison with a commercial stew or soup. This should be helpful in realizing how sodium-rich commercially canned soups and stews or meats really are.
3. Have participants go to the grocery store and check processed foods in the regular section of the grocery store and in the special diet section of the grocery store. Use the list for "Grocery Store Label Check Activity" (in Handout Samples).
4. Have a basket or grocery sack filled with either labels from all types of processed meats or the packages of convenience meats. Ask participants to spot the sodium sources by reading both the nutrition information and the label information. Explain the sodium sources and why they were added to the product. Try to include some low-sodium processed bacon or sausage.
5. Invite a dietitian, home economist, meat processor or retailer and nurse to the meeting to discuss the salt-sodium connection to hypertension and how meats fit into a heart-healthy diet. Ask them about sodium sources related to processing of

each food group. Also, find out if meat processors are making changes in processed meats so that they will contain less sodium.

6. Have all participants make the no-salt and low-sodium catsup recipes. Emphasize that the addition of salt substitutes that contain potassium or other minerals is not recommended unless ordered by the physician. However, they can see that these recipes are using other spices instead of exchanging the sodium for potassium. Then allow participants to broil lean meat adding the salt substitute "No-Salt." Prepare frozen French fries for testing the low-sodium catsup. (Note: The "Form for Rating Heart-Healthy Meat Patties" can be used to rate the quality of the meat using the new blends.)

Recipes for the Activity #6 are:

Dill Butter

Blend 1/4 pound unsalted butter or margarine with 1/2 teaspoon dill weed and 1 teaspoon white wine vinegar. Spread on broiled fish, or season green beans, cabbage or broiled tomatoes.

Salad Herb Butter

Blend 1/4 pound unsalted butter or margarine with 1/2 teaspoon salad herbs and 1/2 teaspoon lemon juice. Use on bread or vegetables.

Tarragon Butter

Mix 1/4 cup of unsalted butter or margarine with 1 teaspoon crushed tarragon and 1 teaspoon white wine vinegar. Spread on broiled chicken, steak or fish.

Seasoning Blends

NO-SALT

1 tsp chili powder	6 tbsp onion powder
2 tsp ground oregano	2 tbsp dry mustard
2 tsp black pepper	3 tbsp paprika
1 tbsp garlic powder	3 tbsp poultry seasoning*

Mix; put in shaker with a few grains of rice. Great for all meats, poultry, fish and vegetables!

LOW-SODIUM CATSUP

Put tomato paste and water in a large saucepan. Mix onion, celery, vinegar and sugars in blender (if available) and blend until smooth. Add to tomato paste, along with molasses, spices and herbs. Bring to a boil and simmer uncovered, about one hour, stirring occasionally. Add lemon juice and margarine during the last few minutes of cooking.

- A person has been advised to reduce the sodium content of his/her diet. Assist this person in planning how to accomplish this while on a trip to Japan and China. Con-

8. Explain to group about foods considered high in sodium found in most fast-food restaurants and that most chains have low-sodium information available upon request. Also, explain that foods with no added salt can be ordered. Have participants brainstorm on how they will be able to reduce their sodium intake and still eat at fast-food restaurants.

9. Have participants recall what they have eaten for the last 3 days. Then, have them analyze the sodium sources from:
 - a. Salt and condiments added at the table and in cooking
 - b. Sodium in processed foods
 - c. Sodium naturally present in foods

Provide the handout “Sodium Countdown” plus the U.S. Department of Agriculture Handbooks and other references for nutritive value of foods available for participants to find the nutritive value of sodium. Have participants discuss their sodium intake and how they might lower sodium intake in the future.

Supplementary Resource Materials

For more information about reducing sodium in your diet, order from the following sources:

**U.S. Department of Agriculture
Consumer Information Center
Department EE, Pueblo, CO 81009**

- Home and Garden Bulletin No. 237, "Sodium—Think About It"
- Home and Garden Bulletin No. 232, "Dietary Guidelines for Americans"
- Home and Garden Bulletin No. 233, "The Sodium Content of Your Food"
- Reprint from U.S. Department of Agriculture Food in News, "Sodium, Counting Down"
- Miscellaneous Publication No. 1957, "Dietary Guidelines and Your Diet," Home Economics Teacher Guide

**U.S. Department of Health and Human
Services
Public Health Service
Food & Drug Administration
5600 Fishers Lane
Rockville, MD 20857**

- HHS Publication No. (FDA) 84-2179, "A Word About Low-Sodium Diets"
- DHHS (PHS) Publication No. 88-50211, "The Surgeon General's Report on Nutrition and Health," 1988
- NIH Publication No. 84-1459, "Questions About Weight, Salt, and High Blood Pressure," 1984

**FDA Consumer
HFE-88, Rockville, MD 20857**

Reprints from **FDA Consumer** magazine are:

- "How to Ignore Salt and Still Please the Palate" (salt-less cooking and eating)
- "The Case for Moderating Sodium Consumption" (an explanation of sodium-hypertension connection)

- "Hypertension Target: Blacks, Elderly" (explains why elderly and blacks have greater problems with high blood pressure)

**American Heart Association
7320 Greenville Avenue
Dallas, TX 75231**

- "Cooking Without Your Salt Shaker"

**National High Blood Pressure Education
Program
120/80 National Institutes of Health
Bethesda, MD 20892**

- National High Blood Pressure 12-Month Kit

**National Live Stock and Meat Board
444 North Michigan Avenue
Chicago, IL 60611**

- "Exploring Meat and Health"
- "Meat and Poultry Labels Wrap It Up—With What You Need to Know"

AUDIOVISUALS

**American Dietetic Association
216 West Jackson Boulevard
Chicago, IL 60606-6995**

- "Your Diet, Salt and Hypertension," motion picture, 16mm, 13 minutes, Journal Films, 1982. Audience: Junior and Senior high school students.

**Alfred Higgins Productions, Inc.
Los Angeles, CA**

- "Salt: The Hidden Threat," motion picture, 16mm, 21 minutes, color, 1982

**National Health Systems
Ann Arbor, MI**

- "Low-Salt Unit," poster, 1980

Evaluation Instrument

Use the "Evaluate Your Sodium Sense" as a pre-post test for participants. See copy in handout samples.

Evaluation of the concepts learned through participating in Unit 3 can be accomplished by use of pre-post test(s). At the first meeting, ask participants to complete the brief "Evaluate Your Sodium Sense." Keep the results until the completion of series.

In approximately 6 weeks, ask volunteers on your planning committee to take a representative sample of names on the registration list. Call and ask the participants the enclosed questions on the pre-post test to see if the concepts taught have been retained. This will provide data concerning what participants have learned and retained about this unit.

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MODULE III

Making Sen\$e of Meat Purchases

Just a decade or so ago, it was commonly stated that grocery stores carried from 8,500 to 10,000 products. In 1987, an average store was reported to carry over 24,000 items (FMI) and seems to be increasing. Product variety has become nearly overwhelming to customers and store managers alike. Each new product requires costly display space and support costs through the market distribution system. Costs such as packaging, inventory, promotion and advertising must all be justified. Often, new products must replace existing products. During earlier periods, stores became larger, but that trend has slowed.

Major new developments in meat retailing include: the addition of deli departments, more frozen, prepared ethnic foods, more snack items, shelf-stable retort-pouch packaged entrees and individual vacuum-packaged retail cuts. In addition, poultry and seafood products have greatly expanded.

Shopping for food is extremely challenging when considering nutritive value, taste preferences of various family members, economics and other individual concerns. Although more information is available than ever before, it is scattered and difficult to find in simplified, easily understood form.

To understand the principles for meat shopping, one needs to be aware of why retail stores exist, what they try to accomplish and how meat fits into their market strategies. Food companies continue to seek consumer's preferences for meat products. Therefore, a wide variety of meat products are offered to consumers.

But, like other consumer product groups, muscle foods (meat, poultry and seafood) also appeal to a wide diversity of "wants." Considerations of meat products designed to meet consumer's needs, like those in other consumer products, drive decisions being made in meat marketing. Each segment of meat marketing from livestock production to processing, distribution, retailing and food service is profit driven. If it were not so, we would have many fewer choices and frequent shortages. We should be thankful that small to moderate profits can be made in these businesses and still have the least expensive food, relative to other costs, of any country in the world.

The purpose of this module is to:

- Increase understanding of the many lean meat options found in today's market place (Unit 1).
- Improve skills in shopping for lean meats to receive maximum food value and satisfaction for money spent (Unit 2).

Target Audiences for Module III

In-store shoppers (tours)
Foodservice industry
Culinary students
Chefs' organizations
National Restaurant Association/state or local associations
Food Marketing Institute/state or local grocers associations
Meat market managers with various supermarkets (supervisors and buyers)
Retailers
School foodservice (state and local personnel)
Minority groups (depends on location in U.S.)
Low-income groups (possibly through WIC - Women, Infants and Children)
Young mothers' organizations
University newspapers, students living independently
University classes
High school classes
Elderly
Meals on Wheels personnel
AARP (newsletter)
Magazines
Women's livestock and auxiliary associations, examples:

- American National CattleWomen
- Pork Council Women
- Sheep Auxiliary
- Breed Association Auxiliary
- Youth groups (including 4-H, FFA, FHA, etc.)

Activities for Module III

Demonstrations/programs for outdoor camps
State and local fairs
In-service for school foodservice and programs at state and national meetings
Point-of-purchase educational materials in grocery stores, possibly using samples
Magazine articles
Newsletters (i.e., AARP, Recreations/Fitness groups)
In-store programs/tours
Newspaper articles

Unit 1. Meat Cut Identification and Evaluation

Contents

	Page
Objectives	4
Concepts	4
Background Information	6
• Fat Deposition (External, Seam and Marbling) Patterns	6
• Bone and Muscle Shapes, Anatomy and Tenderness Patterns	6
• Meat Colors	9
• Meat Cut Variations (Forms)	11
• Meat Grades and Other Terminology	15
• Meat Safety—Government, Industry and Consumer Roles	18
• Packaging Meat for Consumers	20
Leader Lesson Plan	23
• Advance Preparation Guide	23
• Presentation Guide	23
Handouts	26
• Meat Cut Selection Knowledge	
• Veal—Retail Cuts	
• Beef—Retail Cuts	
• Lamb—Retail Cuts	
• Pork—Retail Cuts	
• Primal Cuts of Veal, Lamb, Pork and Beef	
Suggested Learning Experiences	27
Supplementary Resource Materials	28
Evaluation Instrument	32
References	33

Unit 1. Meat Cut Identification and Evaluation

Objectives

After completion of this lesson, consumers will be able to:

- 1 Correctly identify areas of the carcass from which meat cuts of beef, pork, veal and lamb come, tenderness level by area and recommended cookery methods.
- 2 Describe available meat cut forms such as roasts, steaks, chops, sliced, cubed, wafered, ground, tenderized or restructured alternatives and processes such as salting, curing and smoking in the market.
- 3 Differentiate normal fresh, frozen, cooked, cured, abnormally pale or dark and off-condition (spoiling) meat colors.
- 4 Name at least three variety meats with reasons why they are good occasional alternatives.
- 5 Relate the common USDA meat grades and other trade terminology to expected eating quality and leanness of meat cuts.
- 6 Recognize the meat inspection legend, and know its significance.

Concepts

- 1 Leanness in fresh meats can be assessed visually. Ground beef is usually sold at two or three leanness levels. Ground pork or lamb is usually sold at only one leanness level, which may vary substantially among stores (sources).
- 2 Bones and muscle shapes, if identifiable, will assist meat cut identification. Muscle location in a carcass relates both to tenderness and relative leanness.
- 3 Meat colors provide clues to many important factors—among them, kind of meat, maturity, muscle function, fat/lean content, oxygenation/oxidation state, salt addition, nitrite curing, cooking degree, microbial spoilage and abnormal muscle chemistry or possible contaminants.
- 4 Meat cuts come in several forms (roasts, steaks, thin sliced, tenderized, bone-in, boneless, fat trim levels of regular, less than 1/4 inch, and no fat) which have some value trade-offs.
- 5 Ground meat may be presented at various fat levels and prices and in several forms, such as bulk and small packages, patties (usually frozen), coarse or fine ground.
- 6 Restructured meats are available as lower-cost alternatives to regular whole muscle cuts.
- 7 Salt and seasoning(s) are added to some ground meats to make simple processed products such as fresh pork sausage.
- 8 Fresh meat is cured by adding nitrite, salt and other optional ingredients to make ham, bacon, corned beef, pastrami and dried beef. Cured meats have unique flavors, textures, higher sodium content and longer keeping qualities than uncured counterparts.

- 9 Smoking cured meats while slow cooking adds another flavor and tenderness/texture variation that many meat customers enjoy for variety.
- 10 Variety meats offer other nutritious, low cost, taste and texture alternatives.
- 11 USDA meat grades and other industry terminology assist the industry in pricing, and consumers in value determination.
- 12 Government meat inspection and meat plant/retailer quality assurance programs assure wholesome meat to the consumer.
- 13 Odors of meat provide clues as to its freshness and safety.
- 14 Fresh meat is a perishable food and must be sold and used quickly to avoid spoilage even when proper refrigeration and packaging are used. Packaging with modified atmospheres and freezing are used to extend shelf and storage life.

Background Information

Fat Deposition (External, Seam and Marbling) Patterns

Fat in animals is usually deposited in a predictable pattern. (See Figure 1., Apple, 1990) External fat, as it appears on meat cuts, can be controlled by careful trimming. Seam fat between muscles is more difficult to remove, and may be left in the cut until the time of eating. Marbling, the flecks of fat found within the muscle, cannot be trimmed away at any time. Small amounts of marbling are acceptable for most people if trimmable fats are removed. Long term reductions of external and seam fat can be achieved through animal breeding and selection of leaner-type meat animals by producers. Short term, meat processors and retailers may need to trim fat away.

1. Much closer trimming by meat processors and retailers is already being done to provide meat customers a leaner product. (See Figure 2.) A recent nation-wide Beef Market Basket Survey in 1987-88 (Savell et al., 1988) indicates that the "1/4 inch or less" fat trim program widely adopted by retailers has been highly successful. Beef cuts actually averaged only 1/8 inch fat thickness. Fat content of beef cuts was found to be reduced nearly 28 percent from the corresponding cuts analyzed and presented in the Composition of Food tables in USDA Agriculture Handbook 8-13, Beef Products (1986).
2. Concentrations of visible fat are found as external fat covering or seam fat between muscles in a meat cut. Trimming fat at home can be made easier by chilling the cut in the freezer for 30 to 60 minutes before trimming. If these fats have not already been trimmed away prior to cooking, large reductions in calories can be made by simply trimming fats away at the table. Seam fat is particularly difficult to trim away prior to "on the plate" without damaging the cut appearance or structure.
3. Marbling, if present, will appear as small white flecks in the meat. Small amounts of marbling, even to that level found in the low to mid range of the U.S. Choice beef grade, can fit into a customer's low fat diet.

Meat from the U.S. Select beef grade, with less marbling, will have even fewer fat calories. Marbling self-bastes the meat sufficiently as it's cooking, so that no additional fats or oils are necessary for flavor or juiciness. As an example, a U.S. Choice grade rib steak trimmed of external fat will contain about 90 calories from fat per 3-ounce cooked (broiled) serving and 191 total calories compared to 76 calories from fat and 178 calories in a 3-ounce serving of U.S. Select grade beef (USDA Agriculture Handbook 8-13, 1986). The maximum recommended fat calories for an average adult female on a 2,000 calorie per day diet is 600 calories. So two 3-ounce servings of either marbling level will easily fit within recommended daily allowances if other food choices are made with equal care. (See Figure 3 picturing example marbling degrees [raw] and their respective fat percents on a closely trimmed "raw and cooked" basis.)

Bone and Muscle Shapes, Anatomy and Tenderness Patterns

Meats from cattle (beef and veal), hogs (pork) or sheep (lamb) are very much alike in many respects. Differences to be seen in meat cuts are mainly ones of size and muscle color. Some of the similarities are:

1. Anatomy of muscle and bone shapes and their location are quite similar among livestock species. (See Figure 4 for comparison of three loin cuts from beef, pork and lamb.)
2. Similar muscles function much the same in each of the species. Therefore, relative eating characteristics, particularly tenderness, of the cuts at any given location are similar among the species. In general, muscles that must work hard in moving the animal or its parts (locomotion or respiration) are less tender while those that mainly support or hold the various parts of the animal together are more tender. Tender muscles tend to be along the middle of the back and the center section of the hind leg.

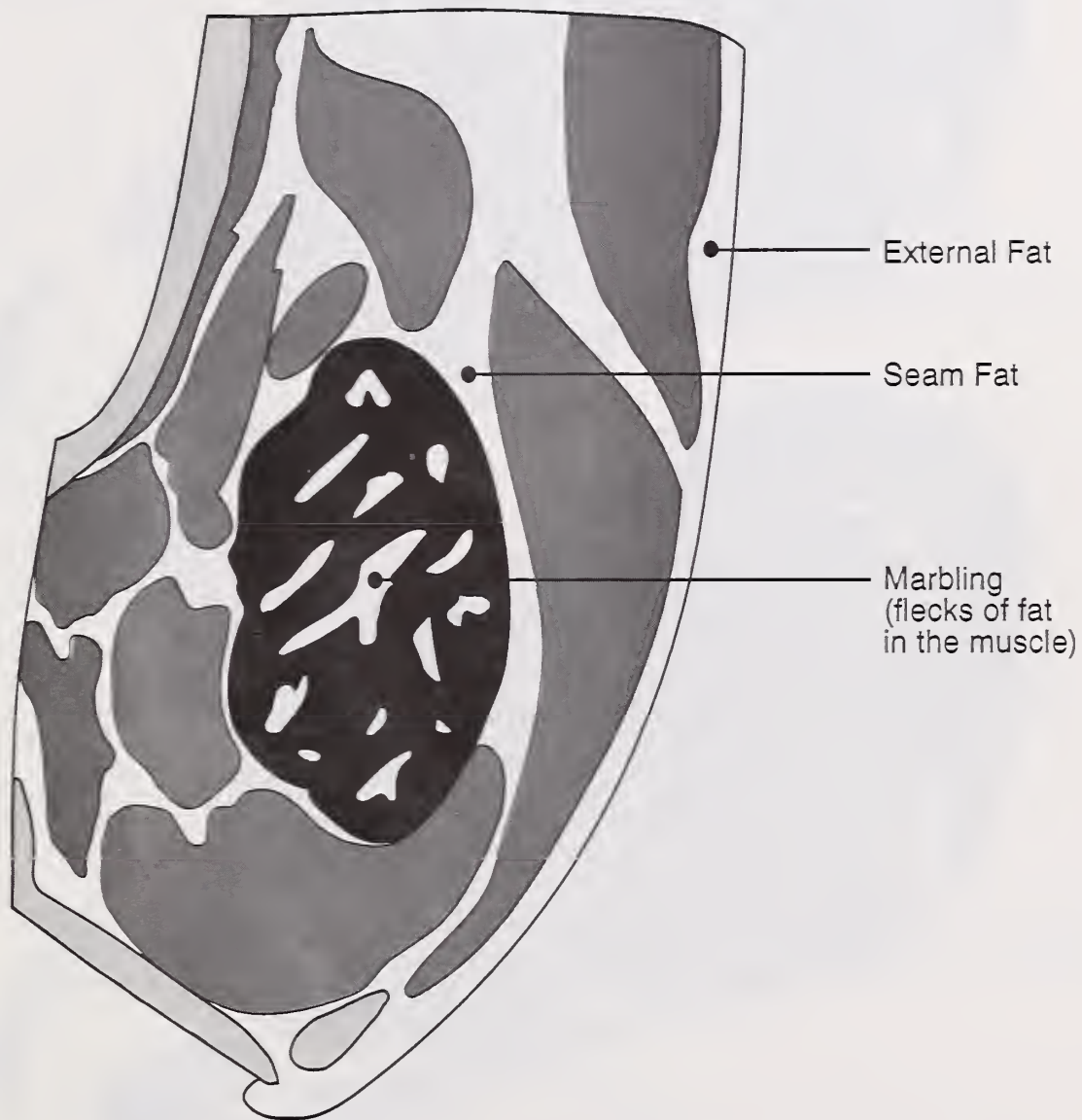


Figure 1. External, Seam and Marbling Fat Distribution

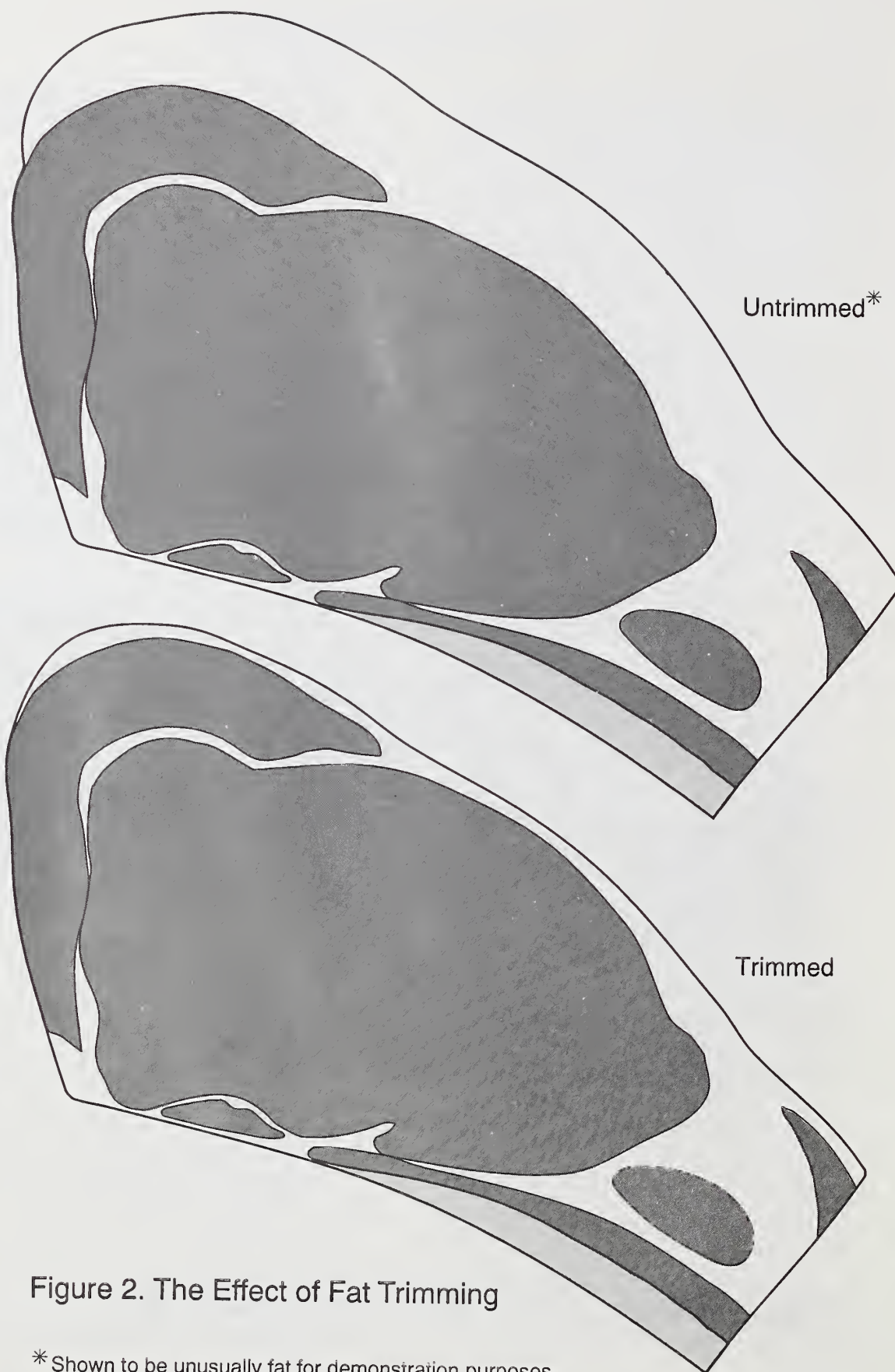


Figure 2. The Effect of Fat Trimming

* Shown to be unusually fat for demonstration purposes.

Figure 3. Marbling, Fat Levels, and U.S. Quality Grades for Beef



Marbling Level: Slight^a
Percent Fat: Raw 2.9%^a
Cooked, 4.3%
USDA Quality Grade: Select—



Marbling Level: Small^a
Percent Fat: Raw 4.7%
Cooked, 6.4%
USDA Quality Grade: Choice—



Marbling Level: Moderate^a
Percent Fat: Raw 7.6%
Cooked, 10.3%
USDA Quality Grade: Choice +

The above illustrations are “trimmed” reproductions of the official USDA Marbling Photographs prepared by the National Live Stock and Meat Board for the U.S. Dept. of Agriculture. For accuracy, it is recommended the official photographs be used.

^a Campion and Crouse, 1975



THE MEAT BOARD...BUILDING DEMAND THROUGH INDUSTRY CHECKOFFS SINCE 1922

3. Connective tissue in all species becomes tougher with age.
4. Weights at maturity differ depending on the animal's genetic potential, but fat deposition will increase in each species as the animals reach mature size. For example, veal calves are low in fat, less than 10 percent, and gradually increase in fat to the level found in mature beef, approximately 30 percent. Larger beef types, however, can grow to heavier weights while still retaining excellent leanness. They don't mature and fatten as soon as "smaller-type beef" cattle. Tenderness patterns have not been shown to be mature-size related.
5. Within an animal, individual cuts will differ slightly in leanness. Generally, the larger active power muscles contain less fat. These muscles tend to be located in the hind portion of the carcass, e.g., round, ham or leg cuts. Muscle tenderness is definitely location and function related.
6. Marbling (flecks of fat within the meat) may be found in varying degrees in beef, pork and lamb, and occasionally in veal. In younger animals, research indicates marbling plays only a small role in meat tenderness, contributing more to flavor and juiciness.

Meat shoppers can look for meat cuts from six basic areas of the animal carcass. See Figure 5 for a comparison of those areas in beef, pork and lamb. The six areas correspond to the major wholesale or primal cuts of a beef carcass with slight modifications in pork, lamb and veal. The simplest identifying features will be bone shapes. The six distinctive bones are:

1. Arm bone—Chuck/shoulder cuts
2. Blade bone—Chuck/shoulder cuts
3. Rib bone—Rib cuts
4. T-bone—Loin cuts
5. Hip bone—Sirloin cuts (bones are generally removed from beef, but still are found in pork and lamb)
6. Round bone—Leg, round and ham cuts

Along with, or in the absence of the bones, distinctive muscle shapes and relationships will provide important clues to meat cut identity and their potential tenderness. Look for those shapes (Figure 5).

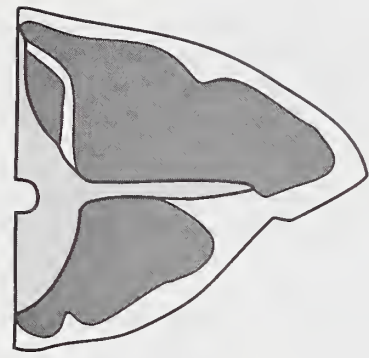
Cuts in these and other areas could be ranked for tenderness as follows:

Most tender	• Tenderloin in loin and sirloin cuts
	• Loin and rib eye cuts
	• Sirloin cuts
↑	• Inside or top round/fresh ham/lamb leg
to	• Tip of round/fresh ham
↓	• Outside or bottom round
	• Blade cuts
	• Eye of round
	• Arm/shoulder cuts
Less tender	• Brisket/flank/lamb riblets/fresh pork side

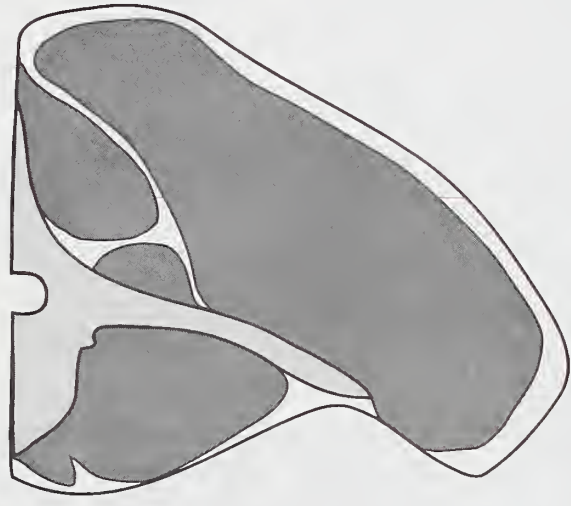
Meat Colors

Normal fresh meat color varies, depending on the species and age of animal. Beyond that, meat color can be affected normally by oxygen level in the package, nitrite curing, cooking, microbial spoilage and biochemical changes affecting the meat's acidity, which may cause unusually pale or dark meat. Furthermore, on occasion, meat with tiny blood spots may be found.

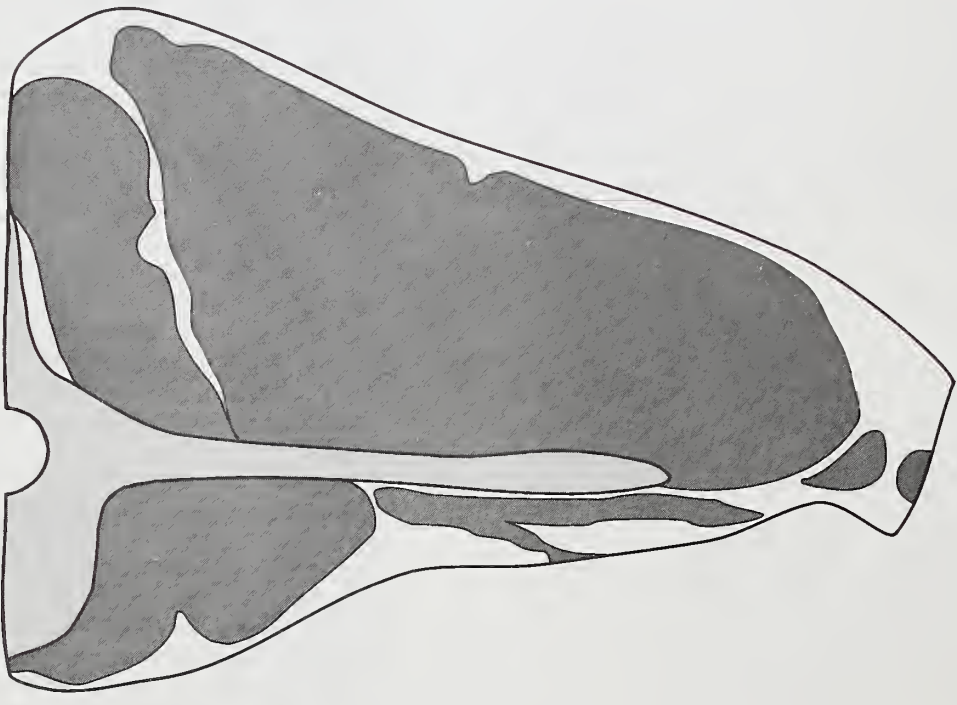
1. Colors of beef, veal, pork and lamb meats usually differ enough that color alone can be used to identify the different kinds of raw meat. See Retail Cut Charts of Veal, Beef, Lamb and Pork, or look at good fresh meat cut examples for normal species color comparisons. Beef is cherry red; pork, light grayish-pink; lamb, pinkish-red; veal, white to light grayish-pink color under normal lighting and when meat is fresh.
2. Age (maturity) can often be estimated by the relative darkness of meat pigment as the animal matures. An excellent maturity color contrast in the same species is light grayish-pink veal (very young beef), compared to more mature, bright cherry red beef. Older cow or bull meat is an even darker mahogany, purplish-red color. The ossification (conversion to bone) on the tips of bones in



Lamb



Pork



Beef

Figure 4. Beef, Pork and Lamb Loin Cuts Comparisons

steaks and roasts from along the back (e.g., chuck blade, rib, loin and sirloin areas) is a more accurate method to assess maturity when the bones are still present.

3. Freshness of meat can be assessed with a knowledge that predictable color changes occur from the freshest cut purple-red meat (without oxygen), to the bright oxygenated meat color (with oxygen) and finally to a deteriorating brownish or grey-green color when severely oxidized or microbes start to spoil the meat.
4. Packaging type also determines the oxygen-status of the cut, and that affects its color. Oxygen permeable packaging, the kind used to display most fresh meat cuts, allows the bright red color to develop. Oxygen impermeable packaging, the kind used by meat suppliers for shipping meat to stores, and sometimes used to sell larger cuts direct to customers without further cutting, allows no oxygen causing a reversion to the more purplish color.
5. Cured meat color results from a chemical reaction between nitrite and the meat pigment myoglobin. When the meat is cooked, the pink cured color becomes fixed.
6. Cooked fresh meat will change to a brown or gray color and pink will be lost as the cooking temperature rises. Cooked, cured meat will remain a bright reddish pink due to the presence of the nitrite which has become bound to the meat pigment.

Meat cooked to rare (140° F), or medium rare (150° F) will retain a red to pink internal color. Meat cooked to 160° F (medium) may turn gray initially, but sometimes reverts to a pinkish-red color under certain conditions. Well-done (170° F+) meat will remain gray to brown-colored. A cooked beef "degree of doneness" color guide is available, in color, from the Meat Board (NLSMB and Texas Agricultural Experiment Station, 1979).

7. Spoiled fresh meat will start turning grayish-green or brown as the bacteria and other microbes grow on the meat surface, chemically oxidizing the pigment. Although not necessarily unfit to eat, meat with slight deterioration should be well cooked. Clues that fresh meats must be salvaged quickly, or disposed of include: grey or brown color spot-

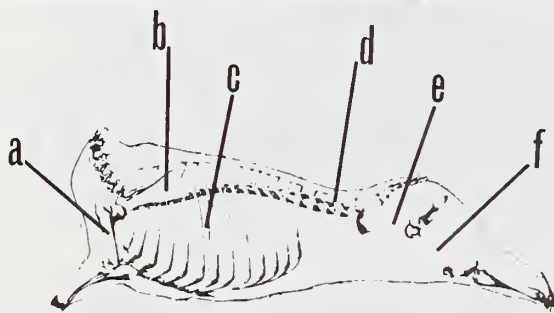
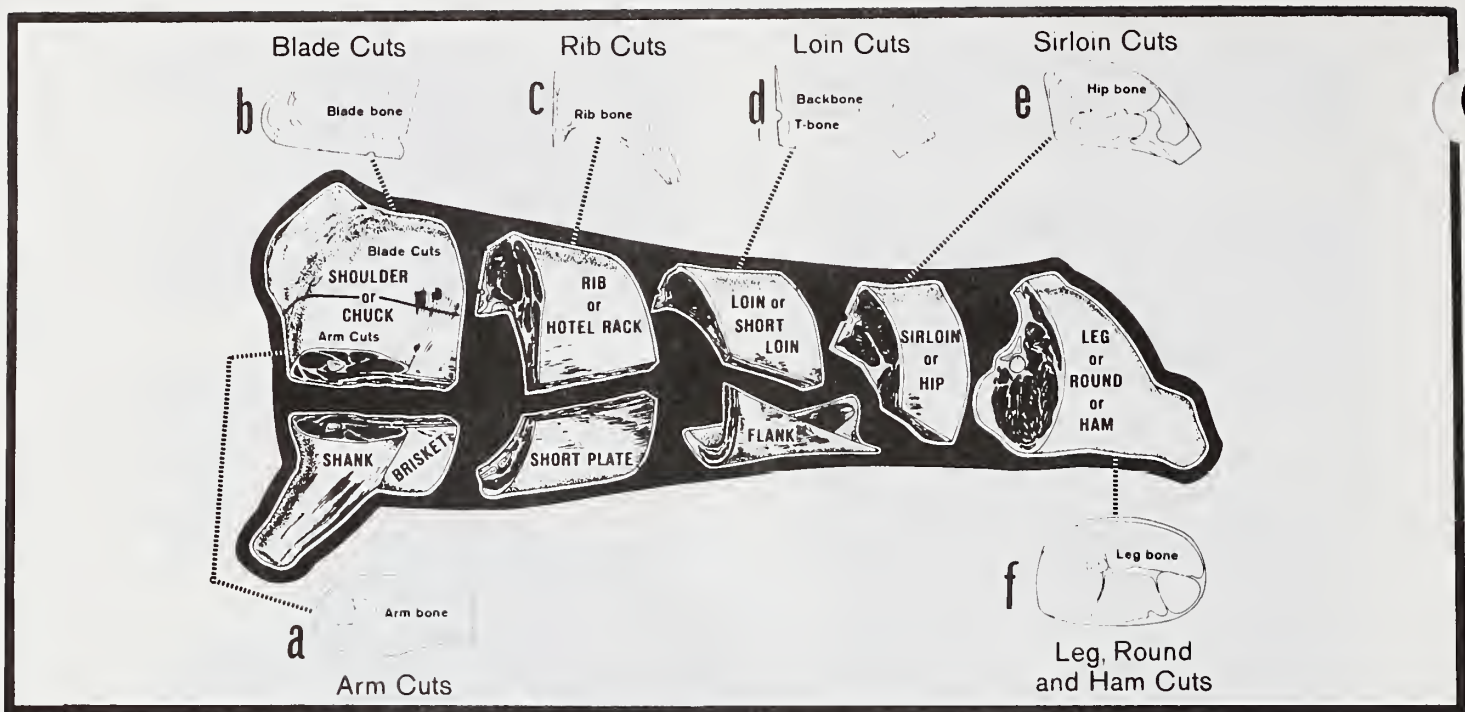
ting, faint yeasty aroma and stickiness on the meat surface or inside the wrapping film. Cooking fresh meat until no pink color remains should kill any common disease-causing microorganisms. When raw meat becomes totally brown, putrid in odor or slimy, it is beyond salvage, and must be discarded in a health-safe and environmentally responsible manner. Avoid contaminating other fresh or ready-to-eat foods.

8. Unusually pale pork and dark beef or lamb may occur in a very few animals unable to adapt to the stresses of their environment. Pale pork may be displayed for sale, but dark meat is not normally placed in the retail meat case. If pale meat is determined to be fresh (not spoiled), it should be as safe as other fresh meat.
9. Persistent red color of well cooked fresh meats has occasionally been noted when nitrite, incomplete combustion of cooking gases (carbon monoxide, most likely), or sulfites have accidentally contaminated meat. None of these alone necessarily indicate the meat is hazardous to eat, but the apparent lack of control over such factors raises questions that need to be immediately addressed to establish cause and extent of the problems.

Meat Cut Variations (Forms)

Terms commonly used for different retail cut forms include roast, steak, chop, slice, cube and wafered. These traditional words give some clues as to cut thickness or size, species of origin and recommended cookery method.

1. **Roasts** generally are 1 1/2 to 2 inches thick or greater and range from those tender enough to dry heat roast to those that are best moist heat braised.
2. **Steaks** are moderately tender to tender cuts, mostly from beef, that can be broiled, fried or braised. They are usually 3/4 to 1 1/2 inches thick.
3. **Chops** are tender cuts from pork, lamb or veal that can be broiled, fried or roasted. Historically, when meat cleavers were still used in meat cutting, chops were small enough to be easily chopped with a cleaver. Some pork and veal exceptions to the above

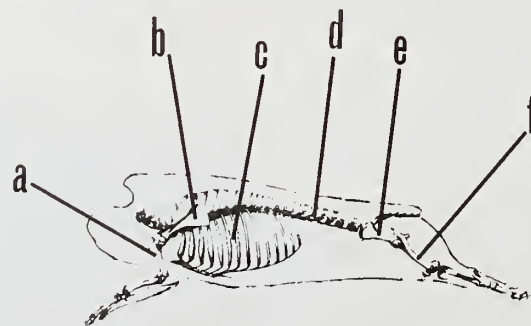
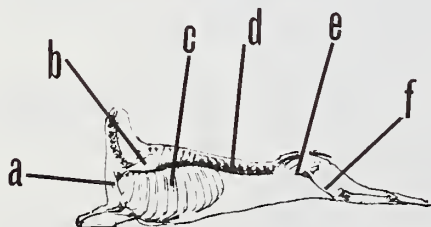


Beef

- A. Beef Chuck, Arm Pot Roast
- B. Beef Chuck, 7-Bone Pot Roast
- C. Beef Rib, Steak Small End
- D. Beef Loin, Porterhouse Steak
- E. Beef Loin, Sirloin Steak
- F. Beef Round Steak

Pork

- A. Pork Shoulder, Arm Steak
- B. Pork Shoulder, Blade Steak
- C. Pork Loin, Rib Chop
- D. Pork Loin Chop
- E. Pork Loin Chop
- F. Pork Leg, Center Slice



Lamb

- A. Lamb Shoulder, Arm Chop
- B. Lamb Shoulder, Blade Chop
- C. Lamb Rib Chops
- D. Lamb Loin Chop
- E. Lamb Leg, Sirloin Chop
- F. Lamb Leg, Center Slice

Figure 5. Cuts from major areas of beef, pork and lamb carcasses and carcass locations

Courtesy of the National Live Stock and Meat Board, Chicago, Illinois

chop naming rule are pork shoulder blade steak, ham steak, cubed steak and several veal shoulder and round steaks. Steaks are usually larger or have harder bone, and were cut by hand saw. Chops and steaks both are usually 3/4 to 1 1/2 inches thick.

4. **Slices** generally are 1/8 to 1/2 inch thick and could be characterized as quick preparation cuts. Examples are: sliced bacon, ham slices, lamb neck slices, round steak strips for Stroganoff and top sirloin strips for stir-frying. Sliced across the grain, meat is tenderized; sliced with the grain, cuts maintain a chewy texture. Microwave and stir-fry cooking have increased interest in the thinner sliced, quick preparation type cuts.
5. **Cubes and Kabobs** are cubically shaped 1 to 1 1/2 inches, quite tender, and often cooked by grilling, broiling or stir-frying. If less tender muscles are cubed, they should be moist heat cooked. Cubed steaks are thin sliced muscles, moderately tender, that are further tenderized in a mechanical tenderizer.
6. **Wafered Meats** are always processed, cooked, ready-to-eat and sliced very thin.
7. In most stores **ground meats** (beef, pork and lamb) are ground at least twice, packaged and displayed on a styrofoam tray in a polyvinyl chloride (PVC) film, heat-sealed on the bottom. The bright, oxygenated, cherry-red meat color of ground beef occurs because oxygen passes through the film to brighten (oxygenate) the outside meat color. An interesting phenomenon that often concerns meat customers is the darker purplish-red core of meat found in the center below the oxygenated surface. This is altogether normal. The color has reverted to the deoxymyoglobin (without oxygen) form.

Even though all the ground meat has been oxygenated (brightened) during grinding, the oxygen at the center of the meat is consumed faster by the metabolism of meat and microbial cells than it can be replenished through the barrier of the package and meat on the surface. Given a few moments, the center meat will again re-brighten with exposure to air.

Some packages of ground beef, usually 3- to 5-pound chubs in pre-printed, non-trans-

parent polyethylene tubes, are prepared at a meat processing plant rather than in the retail store.

8. **Whole Muscle Cut** meats can be tenderized by at least three methods:
 - a. *Mechanical tenderization* of lean, medium tenderness meat (e.g., round or flank, selected shoulder muscles) is done by placing meat in a machine with many sharp, rotating knives. Juiciness may be lost through this process. Blade tenderization is another less extreme variation where sharp, surgical steel needles penetrate the meat to cut connective tissue. Examples might be called "cubed" steaks or "tenderized."
 - b. *Naturally-occurring enzymes* in the meat tenderize muscle and connective tissue during aging periods up to 10 to 12 days. (Note: precautions must be taken against meat spoilage during this period, i.e., longer term [5 to 12 days or longer] aging should not be attempted unless done in carcass form, or in a good vacuum package. Good temperature [30° to 36° F] control is necessary.) Meat tenderized in this manner is referred to as "aged." Additional aging of vacuum-packaged wholesale meat cuts up to three weeks can be done in the home refrigerator. Since length of aging time before purchase is unknown, it would be best to establish a starting date from the packing codes available from the meat department when you purchase the meat. Make sure the package has a good vacuum. At the end of this extended aging period, use the meat immediately, or freeze in good freezer protection in pre-cut portion-sizes for later use.
 - c. *Selected plant enzymes* are injected, sprayed or dipped to tenderize some mature meats. Products using this method are usually available only at restaurant, deli or some frozen meat outlets.
9. **Restructured meat products** involve the process of taking large pieces of meat from less expensive cuts and forming them into a single cut that would appear to have the characteristics of a regular steak or roast. Generally they are made to retain a texture similar to, but perhaps more uniform than,

intact muscle cuts. They frequently are pre-cooked, ready-to-serve or reheat and are often found in franchise restaurants or store delis. However, a few fresh, uncooked products may be found in frozen or fresh meat cases at retail. They provide added convenience to the consumer and uniformity of portion sizes in many cases. These products upgrade previously lower valued pieces of meat. Generally, they are lightly salted to bind meat pieces together for regular meat-like texture, and small amounts of phosphate are added to retain moistness. Flavorings also may be added. Pre-formed cuts may be either frozen fresh or pre-cooked and frozen. These processes may allow more fat to be added than in typical fresh meat cuts. Check the label or inquire when you think fat may be excessive. Examples of restructured products are:

- Pork McRib®—McDonald's Corporation
- Restructured Roast Beef—Arby's, Hardee's and many store delis
- Nugget or fritter technology—breading, battering and precooking—several kinds
- Spam®, restructured, canned and cured pork trimmings—George A. Hormel Co.
- Steak-umm®, Beef Sandwich Steaks—Gagliardi Brothers, Inc.
- Johnny Rib®, Weber Farms, Division of ConAgra
- Sizzlean®, Leaner Breakfast Strips, cured, chopped and formed pork—Swift
- Firebrand®, Beef Strips, cured, chopped and formed—Swift
- Flavorlean®, Pork and Bacon, cured, chopped and formed—Farmland
- Lean 'n Tasty®, Beef Breakfast Strips, chopped and formed—Oscar Mayer

10. **Salt pork** and fresh pork sausage are two traditional salt-containing meat products (also high in fat) which you may find in the fresh meat counter. The pork sausage will also contain spices and seasonings. Some customers occasionally prefer the flavors of these variations on fresh meat.

11. **Cured Meats** contain very precise small amounts of nitrite along with salt, ascorbate, sugar and other flavorings to give a special flavor, color and increased safety from harmful bacteria. Examples of whole muscle cured meats are ham, bacon, corned beef and pastrami. Many other luncheon meats and sausages are also cured. Nitrite in the ingredient statement classifies a product as a cured meat.

12. **Smoked Meats.** After meats have been cured, many are smoked with wood smoke or sprayed with liquid smoke flavoring while being slowly cooked. Some are fully-cooked to at least 152° F internal temperature while others are only partially cooked for later reheating or further cooking before eating. Benefits from smoking include improved flavor from the smoke, extended refrigerated storage life, some antioxidant properties to slow rancidity and uniform tenderization from the natural enzymatic and steam break-down of connective tissue which occurs during slow cooking.

13. **Variety Meats** include: liver, heart, tongue, sweetbreads, kidney, oxtail, brains, tripe, pig's feet, chitterlings, tails and ears. Sweetbreads are beef or calf thymus; tripe is beef rumen and reticulum (stomach); chitterlings are small intestines. (Refer to Figure 6 for comparisons of several common variety meats.)

Variety meats provide low cost, nutritious and low fat alternatives for those who enjoy different flavors and textures (Koudele et al., 1988). Cholesterol contents, however, are higher than those of other meat cuts. Special knowledge and care may be required to prepare them successfully for a broad range of palates. Liver is by far the most popular. Gourmet restaurants often feature one or more of these exotic meats. (See Table 1 for nutritive value of some of the more common variety meats.)

Meat Grades and Other Terminology

Meat grades may assist meat shoppers in their buying decisions, but they really are designed more for communication and pricing purposes of those in the meat trade.

Grades and classes of meat, weights and amounts are the language of meat buyers and sellers. Basic price relationships exist between grades and classes of meat, but are continually adjusted to account for supply and demand changes.

The U.S. Department of Agriculture (USDA) has set standards for **quality** (expected eating quality or palatability) and expected **yield** of lean meat in carcasses. The standards generally are based on university and government research of factors that relate to, or detract from, the value of meat. Standards are periodically updated to reflect industry and consumer needs.

Grades divide the full range of carcass variability into more uniform subgroups. Grading is a **voluntary** marketing service paid for on a fee basis by the meat packing plant and performed by U.S. Government meat graders employed by USDA. This arrangement is intended to provide unbiased "third party" evaluation for assigning the grades. Intensive training, with considerable supervision and review, is given to assure accurate grades within the standards and guidelines established.

1. **USDA Quality grades** are developed for use on beef, lamb and veal. Pork is not quality graded, since nearly all hogs are grain-fed and come to market at a young age. All of those factors tend to increase the uniformity of pork palatability, so a grading system for pork quality is unnecessary.
 - a. Beef grades (USDA, 1975) are discussed more extensively, because more variation is found in the marketplace. Principles on which beef quality grades are based are similar for lamb and veal.

The two primary factors determining Quality grade are:

- Degree of maturity (animal age)
- Fat deposits within the meat (marbling or intramuscular fat)

Maturity is mostly related to meat tenderness. Marbling, although a fat and calorie source, self-bastes the meat during cooking, contributing some flavor, juiciness and some tenderness. U.S. Prime, Choice, Select/Good, Standard, Commercial and Utility are the most common Quality grades. U.S. Commercial and Utility beef is from older cattle and seldom would be found at the retail store except in the form of ground beef or other products where special tenderizing was done. U.S. Prime contains more marbling than most consumers wish to buy. The very small amount of meat in the Prime grade usually goes into the white tablecloth restaurant trade. U.S. Choice, with an intermediate marbling level, is the grade most frequently found in meat counters of supermarkets. However, many supermarkets also carry the slightly leaner U.S. Select grade or ungraded "no roll" beef as a lower cost alternative. Other stores will carry only U.S. Select or ungraded "no roll" beef. Select grade beef is being used to an increasing extent since the designation of that grade name in 1987.

Ungraded or "no roll" beef has received no official grade designation; therefore, cuts could be quite variable. Most likely, beef cuts with no grade claims will be of a quality level comparable to either the Select, Standard and perhaps the younger end of the Commercial grades. This creates a great deal of variation in the palatability of beef offered at the retail meat case.

If the grade of beef is important to you, and it is not plainly evident through advertising, signs or the edible blue ink grade shield markings sometimes seen on steaks or roasts, ask the meat department manager

Table 1. Nutritive values of variety meats, cooked

Variety Meat	Approximate Measure (ounces)	Calories (Kcal)	Protein (g)	Fat (g)	Cholesterol (mg)	MINERALS			VITAMINS				
						Iron (mg)	Zinc (mg)	Sodium (mg)	A (IU)	Thiamin (mg)	Niacin (mg)	B ₆ (mg)	B ₁₂ (mcg)
Brains, pork ^a , braised	3	117	10	8.1	2,169	1.6	1.3	77	0	.07	2.8	.55	5
Heart, beef ^b , simmered	3	148	24	4.8	164	6.4	2.7	54	0	.12	3.5	.18	12
Kidney, beef ^b , simmered	3	122	22	2.9	329	6.2	3.6	114	1,055	.16	5.1	.44	44
Liver, beef ^b , braised	3	137	21	4.2	331	5.8	5.2	60	9,011	.17	9.1	77	60
Liver, pork ^a , braised	3	141	22	3.7	302	15.2	5.7	42	4,589	.22	7.2	.48	16
Sweetbreads, beef ^b , braised	3	271	19	21.2	250	1.3	—	99	0	—	—	—	—
Tongue, beef ^b , simmered	3	241	19	17.6	91	2.9	4.1	51	—	.03	1.8	.14	5
Tongue, pork ^a , braised	3	230	20	15.8	124	4.2	3.9	93	0	.27	4.5	.20	2

• Numbers are rounded for simplicity where effect is minor.

• Some cuts do not have all nutrient data.

Sources:

^a Composition of Foods - Pork Products: Raw, Processed, Prepared. 1983. Ag Hdbk 8-10, USDA-HNIS

^b Composition of Foods - Beef Products: Raw, Processed, Prepared. 1986. Ag Hdbk 8-13, USDA-HNIS

which beef grade(s) they carry, and how you can tell which grade you are buying.

- b. Lamb in the United States is generally grain-fed and more than 98 percent of it grades U.S. Choice or Prime. An alternative you may find in some stores is frozen, or frozen and thawed imported lamb (usually from New Zealand or Australia). This lamb is most likely grass-fed, and has not been U.S. graded.
- c. Veal and calf are from very young cattle. Veal will usually be quite pale grayish-pink in color while calf will have slightly larger cuts that are grayish-red in color. Color of meat and carcass size are major determinants in veal or calf grades.

2. **USDA Yield grades** of beef, pork and lamb are almost entirely used within the meat trade to communicate about, and to establish prices on carcasses of significantly different yields of lean to fat and bone. Yield Grades range from one through five (pork, one through four) with Yield Grade one being very trim and meaty and five having excess fat. Most beef will be Yield Grade two and three. Differences in yield of lean meat per Yield Grade will approximate 5 percent of carcass weight (3 percent for pork). The only place a consumer will really benefit from knowing the Yield Grades is if carcasses, primals or sub-primal cuts are being purchased. On regular retail cuts, the meat cutters have already trimmed away most differences before the customer purchases the cut.



Livers. Pictured at top is beef. Middle left is veal. Middle right is lamb. Bottom is pork. Beef lamb and veal livers have two lobes, one predominantly larger than the other. Pork liver has three lobes about equal in size.



Tongues. Pictured in order of size: beef, veal, pork and lamb. Rough skin covers muscles of tongue, including base. It is removed before serving. Sold fresh, cured or cured and smoked.



Kidneys. Pictured at top left is beef. Top right is veal. Lower left is lamb. Lower right is pork. Beef and veal kidneys are made up of many lobes. Pork kidney is larger than lamb kidney.



Brains. All brains are a soft consistency and are covered with a thin membrane.



Hearts. Pictured in order of size: beef, veal, pork and lamb. All are basically shaped the same. Generally sold cut or split. Beef heart has more fat than others.



Sweetbreads. Thymus glands. Creamy white, soft consistency, covered with a thin membrane. Largest from young beef, smallest from lamb. Not found in mature beef.

Figure 6. Variety Meats

Courtesy of the National Live Stock and Meat Board, Chicago, Illinois

The terms "Light (Lite)," "Lean" and "Extra Lean" are recent additions to the U.S. Government-sanctioned terminology related to meat leanness. When the following terms are used, the accompanying standards and restrictions will apply:

- **"Lite*," "lighter," "leaner" and "lower fat"** products must contain 25 percent less fat than similar products on the market.
- **"Lean" and "Low Fat"** products must contain 10 percent or less fat. The amount of fat must be indicated on the label. Some of these products may be labeled "Lite" if the "25 percent reduction of fat" rule can be met.
- **"Extra Lean"** products must contain 5 percent or less fat. Actual amount must be indicated on the label.

One exception is made on the 5 percent "Extra Lean" or 10 percent "Lean" labeling policy for ground beef. In 1988, USDA recognized that leaner than regular ground beef had been sold for many years using "Lean" and "Extra Lean" terms, but with higher fat levels than 5 and 10 percent. To acknowledge terminology and marketing practices already satisfactorily in use, ground beef was made an exception to the general 5 and 10 percent rule. Ground beef with 5 and 10 percent fat would likely be found slightly unsatisfactory (drier, and perhaps slightly rubbery) by most consumers using standard cooking methods and common recipes.

The fat levels traditionally in use for ground beef were 15 to 18 percent as "extra lean", and 21 to 23 percent as "lean," while "regular" was in the 27 to 30 percent fat range.

USDA allows the use of either "Lean" or "Extra Lean" terminology on ground beef, processed and packaged in inspected meat plants, if it qualifies for the "lite" or "25 percent fat reduction from the standard" rule, i.e., no more than 22.5 percent fat. A statement including the measured percent fat must accompany the use of either "Lean" or "Extra Lean" on the label.

Meat Safety—Government, Industry and Consumer Roles

Trained people in the government meat inspection and meat plant quality assurance programs both help assure that meat comes from healthy animals, that it is handled in a sanitary and fit manner through the cutting, processing and transport phases to the retail store and that what is on the label and assumed in "standard of identity" products is accurate and truthful.

To identify the federal government's (or state government's) inspection of the nearly 40 billion pounds of meat processed every year, a circular inspection stamp similar to one below in Figure 7 is found on every carcass or package of meat processed in a plant under government meat inspection. In some states, some meat may carry a similar state meat inspection stamp. Standards for state meat inspection are equal to the federal standards, but because of the laws governing interstate commerce, state inspected meat cannot be sold into another state.



Figure 7. Carcass and Meat Product Federal Meat Inspection Stamp

*"Lite" can have various meanings, including a reduction in fat, calories, sodium or breeding of a product.

All meat and poultry inspection activities are considered a major public health function, and are paid by tax dollars except for inspector overtime pay. Periodically, attempts are made by the government administration to put meat inspection on a fee basis which meat packers and processors would pay and likely pass on. Until now, these efforts have failed. The direct cost of government meat and poultry inspection today is slightly less than two dollars per citizen per year.

Every animal that is slaughtered to be sold as meat is visually examined for healthfulness by a government inspector (Seedle, 1985). As slaughter occurs, each animal is examined closely for any signs of disease or injury. Animals that are condemned are sent for rendering.

Other areas of the plant may have less intense government inspection, but are still subject to random visits, sample collections and more surveillance by processing plant quality assurance personnel.

Meat plants increasingly are building their own staffs to assume more responsibilities for quality assurance (Kastner and Kropf, 1985). The government has welcomed and encouraged more responsibility by plants as a means to control the escalating costs of monitoring process operations. As more science and modern methods are applied to meat inspection and quality assurance, it is possible to increase efficiency and to do an excellent job of preventive inspection. A proposed system to place even more responsibility on the plant quality assurance personnel has been challenged by some consumer activist groups and several meat inspectors who contend that the physical presence of a government inspector during all production hours is critical to the continued success of meat inspection. The issue will most likely resurface again and again because economic pressures to move in that direction will continue. Consumers, as taxpayers, may have some choices on the type of system preferred in the years ahead.

At the retail store level, state or municipal departments of health and environment have the responsibility to inspect stores that market meat and other foods to see that they are handled in a sanitary and safe manner. This inspection is a random, periodic type inspection.

As our society becomes more technologically developed, with most citizens further removed from food sources, public support for food inspection programs among all the food groups seems to be growing even stronger. Currently, public pressure is building to develop an inspection program for fish and seafood (bills are currently before the U.S. Congress).

Meat and poultry inspection at processing plants followed by periodic inspections at food stores and restaurants are designed to keep unsafe meat and other food products from reaching the public. However, due to the perishable nature of these foods, spoilage can occur at anytime in commerce or the consumer's home if the product is temperature abused or mishandled (Fung, 1986). Some responsibility lies with the consumer for continued good care of food and determining its fitness for eating.

Many consumers also use smell to help them decide whether meat is fit to be eaten. Even with many safeguards, self inspection of fresh, ready-to-eat foods is still advised (Penner, 1985). Meat is a perishable food, subject to spoilage, and may become a food hazard when mishandled. Food pathogens (disease-causing microorganisms) may exist without spoilage occurring, but off-condition (unusual color or smell) is a sign for caution. Care should be taken to avoid cross contamination of raw and ready-to-eat foods.

Spoiling food is a gradual process and may or may not involve bacteria that can make you sick. As a general rule, thorough cooking of fresh meat so that no pink color remains should kill any common disease-causing, food-borne microorganisms. Clues that fresh meats must be disposed of include gray or brown color spotting, faint yeasty aroma and stickiness on the meat surface or inside the wrapping film. When raw meat becomes totally brown, putrid in odor or slimy, it is beyond salvage, and must be discarded. After handling, thoroughly wash hands and utensils.

Meat may develop at least two distinct spoilage off-odors.

1. Most bacteria need moisture, food and temperature abuse to multiply. In a moist, oxygen-rich environment like a typical meat package, the bacteria on meat will cause putrefaction or a rotting smell if the meat is temperature abused or left unfrozen for too long.

2. Related to the previous bacterial breakdown, but sometimes independent from bacterial spoilage, is the oxygen reaction with unsaturated fatty acids causing rancid flavor development. Although rancidity alone is not a food safety hazard, the eating experience is less than pleasant.

Vacuum-packaged meat is known to have a strange, slightly acidic "lactic" odor when the package is first opened. This comes from the lactic acid-producing bacteria which thrive in the vacuum environment and slow down the other spoilors. This odor is considered normal for vacuum-packaged fresh meat. The odor should disappear within a few moments after the package is opened.

Packaging Meat for Consumers

Meat packaging in some areas of the world still involves asking the butcher for the cut you want, and having it wrapped in paper, or taking it home directly in your shopping bag.

Packaging materials today have a wide array of capabilities. Costs vary considerably.

Some of the characteristics expected in meat packages are:

1. Moisture-proof or moisture-resistant
2. Oxygen-permeable, or oxygen-impermeable (non-transmitting), depending on product needs
3. Puncture and abuse-resistant to protect product; stretch, shrink and cling to mold to product outline
4. Transparent with attractive gloss, not misleading
5. Rapid and low-failure-rate packaging and sealing capabilities; heat-sealable
6. Resealable to extend storage life
7. Inexpensive for package attributes, and by comparison to competing materials

8. Recyclable, or no problem residues upon incineration
9. Tamper-resistant
10. Rigid support, standardized size(s) for consumer portioning or ease of display
11. Printable
12. Adhesive adaptable for labeling or reclosure systems

A meat seller's choice of packaging materials becomes considerably narrower when several of these factors, including cost, are considered.

Package types that meat shoppers will find include:

1. Retail fresh meat package

Cellophane was replaced by polyvinyl chloride (PVC) film several years ago as the preferred retail meat package for fresh meats (intact muscle and ground meats). It provides moisture-proof, ready oxygen-permeability, puncture-resistance with good stretch, shrink and cling capability, heat-sealable under a styrofoam tray, light weight and relatively inexpensive with good transparent appearance characteristics. The oxygen-permeability allows meat color to brighten naturally to the full extent. The styrofoam tray and absorbent pad, often found under the meat cut, perform several useful functions as a light weight insulator. The tray protects the meat during heat sealing, in the grocery sack on the trip home and makes the retail meat display more attractive.

2. Opaque (non-see-through) ground beef and fresh pork sausage chubs (tubes)

Polyethylene, a low cost, moisture-proof, oxygen-impermeable film is commonly used for processor-branded products. Since consumer confidence is placed in the company producing the product, seeing the oxygenated meat color is less important, and a printable, opaque polyethylene casing is used. The

meat uses up the oxygen originally in the package, thus adding shelf-life. Keeping quality is extended by the absence of oxygen. Polyethylene does not heat seal well under pressure; therefore, most chubs will be metal clipped. Sizes usually range from 12 ounces to 5 pounds.

3. Modified atmospheric packaging of meat

- a. *Vacuum packaging.* Heavy duty nylon-polyester "barrier" film is used to vacuum (air removed) package many primal or subprimal cuts during distribution. Some are presented for retail sale as vacuum-packaged subprimal (large wholesale cuts), or in some markets, retail cuts. These packages are characterized by a very tough plastic barrier to keep air (oxygen) out of the package, causing the meat to appear purplish-red in color. The meat will "bloom" or turn a more cherry-red color when opened and exposed to oxygen as described in the Meat Color section. The airless (vacuum) environment slows the otherwise rapid growth of spoilage organisms as long as the package is kept intact and well-refrigerated.

Formerly, these packages were sealed with metal clips which sometimes allowed air to enter, but new heat sealing techniques remove the need for metal clips. These packages are costly, but provide much greater value to the meat through reduced losses and increased flexibility of marketing. Vacuum packaged meat, if well refrigerated (29° to 35° F), will remain fresh at least two weeks longer than retail packaged meat. Because these packages are such good moisture and oxygen barriers, they also work very well for longer-term frozen storage.

- b. *Pillow pouches.* Some products such as wafered, cured and cooked meats use similar barrier packaging materials with gases such as nitrogen and carbon dioxide in different combinations to extend shelf life, and to keep the product from being compressed by other packages. Products like these require more storage and display space per unit weight than others.

4. Freezer packages for meat

Any food packaging material that will hold moisture in, can keep air (oxygen) out and

can be tightly shaped to the product contours can make a good freezer package. Moisture escape (freezer burn), moisture migration (frost) and oxidation of the fat (rancidity) are the three main problems that good packaging can control. Materials that do very well controlling those problems in frozen meat are aluminum foil (no product visibility, however), polyethylene-coated freezer paper, other polyethylene bags or packages that can be tightly sealed and nylon or other "barrier" materials used for vacuum packaging.

5. Processed meat vacuum packages

Vacuum packaging processed (generally, cured, nitrite- and salt-containing) meat reduces cured meat color fade, retains fresh flavor, and extends shelf life considerably. Products, so packaged, can even be frozen for up to a few months with virtually no problem.

6. Microwaveable meat packages

Packaging is now being adapted to microwave reheat pre-cooked meat items in the package (Gehrke, 1989). Generally, the packages employ a susceptor material (perhaps aluminum in very carefully controlled amounts) to speed heating, and combinations of nylon, polyester, and polyethylene terephthalate (PET) plastic films to protect and contain the product. More developments are likely in this product area. Use of the microwave oven on non-tested materials, or in an unapproved manner should be avoided for safety. Inks, paper and adhesives when overheated may migrate to the food. Packaging is further discussed in Module V, Meat: A Convenience Bill of Fare.

Packaging truly provides many advantages in meat and other food marketing. Soon, the disposal of all consumer packaging materials will be seriously examined for their environmental effect. Benefits should be carefully weighed against problems and costs as long-term decisions are reached.

Mention of product or company names or processes is intended for illustration purposes only. Preferences are not implied by brands listed, not listed or not known to the author.

Leader Lesson Plan

Objectives

After completion of this lesson, consumers will:

1. Correctly identify areas of the carcass from which meat cuts of beef, pork, veal and lamb come, tenderness level by area and recommended cookery methods.
2. Describe various meat cut forms such as roasts, steaks, chops, sliced, cubed, wafered, ground, tenderized or restructured alternatives and processes such as salting, curing and smoking available in the market.
3. Differentiate between normal fresh, frozen, cooked, cured, abnormal pale or dark and off-condition (spoilage) meat colors.
4. Name at least three variety meats with reasons why they are good occasional alternatives.
5. Relate the common USDA meat grades and other trade terminology to expected eating quality and leanness of meat cuts.
6. Recognize the meat inspection legend and know its significance.
4. Meat cuts come in several forms (roasts, steaks, thin sliced, tenderized, bone-in, boneless, fat trim levels of regular, less than 1/4 inch and no fat) which have some value trade-offs.
5. Ground meat may be presented at various fat levels and prices and in several forms, such as bulk and small packages, patties (usually frozen), coarse or fine ground.
6. Restructured meats are available as lower cost alternatives to regular whole muscle cuts.
7. Salt and seasoning(s) are added to some ground meats to make processed products such as fresh pork sausage.
8. Fresh meat is cured by adding nitrite, salt and other optional ingredients to make ham, bacon, corned beef, pastrami and dried beef. Cured meats have unique flavors, textures, higher sodium content and longer keeping qualities than uncured counterparts.
9. Smoking cured meats while slow cooking adds another flavor and tenderness/texture variation that many meat customers enjoy for variety.

Key Concepts

1. Leanness in fresh meats can be assessed visually. Ground beef is usually sold at two or three leanness levels. Ground pork or other ground meats, when available, are usually sold at only one leanness level.
2. Bones and muscle shapes can assist meat cut identification. Muscle location in a carcass relates both to tenderness and relative leanness.
3. Meat colors provide clues to many important factors, among them, kind of meat, maturity, muscle function, fat/lean content, whether oxygen is present, salt addition, nitrite curing, cooking degree, microbial spoilage and abnormal muscle chemistry or possible contaminants.
10. Variety meats offer other nutritious, low cost, taste and texture alternatives.
11. USDA meat grades and other industry terminology assist the industry in pricing, and consumers in value determination.
12. Government meat inspection and meat plant/retailer quality assurance programs assure wholesome meat to the consumer.
13. Odors of meat provide clues as to its freshness and safety.
14. Fresh meat is a perishable food and must be sold and used quickly to avoid spoilage even when proper refrigeration and packaging are used. Packaging with modified atmospheres and freezing are used to extend shelf and storage life.

Leader Lesson Plan

Advance Preparation Guide

1. Read Unit 1. Meat Cut Identification and Evaluation background, lesson plan and handout materials.
2. Complete the activities and interest getter prior to the meeting to better understand the objectives, subject matter and methods of presenting materials.
3. Review beef, pork, lamb and veal retail cut charts of the National Live Stock and Meat Board.
4. Reproduce or order sufficient copies of the following handouts:
 - Veal, beef, lamb and pork retail cut charts, available from the National Live Stock and Meat Board (NLSMB), or complimentary copies from State Beef or Pork Councils.
 - Meat Cut Selection Knowledge Pre-post test
 - Primal cuts of veal, lamb, pork and beef

Consider making transparencies or photocopies of Figures 1 through 5.

5. Obtain:

Fresh beef, lamb and/or pork cuts, with packaging materials and labels, knife, scale and cutting board.
6. Have one sheet of blank paper for each participant.

Presentation Guide

Setting the Stage

HANDOUT: PRE-POST TEST

Ask participants to complete the "Meat Cut Selection Knowledge." (See evaluation instrument suggestions.)

- A. **Meat Basics.** Knowledge of meat cuts can help us make sound decisions when planning meals, choosing meats at the

supermarket and preparing main dishes. Today we will discuss some basics about meat cuts, meat grading, meat safety and packaging.

SAY:

Meat cut identification can be simplified greatly if we use information already available to us prior to shopping and in the store meat department.

Many people tend to get into ruts and cook only a few items. More information about the wide variety of choices available may interest us in using more of the meat cuts available.

To get the audience's interest, pass out a blank sheet of paper to each participant. Have them estimate and write down how many times in the last month they purchased or prepared for at-home use: beef, pork, veal and lamb. Which was the most frequently used species?

Next, have them list the three cuts or forms used most often. (For example, ground meat, lunch meat, roast, chops, steak, etc.) Have them share with the group. Which cut or form was used most often?

Teaching Steps

HANDOUT: "Veal, Beef, Pork and Lamb Retail Cut Charts"

SAY:

Although color reproductions through pictures are not always exact, let's note first the color difference from light colored very young veal to the more intense cherry-red color of young beef. Pork color most typically is close to veal color. Lamb color is intermediate between veal and beef.

Expect older, heavier animals to accumulate more fat (as seen in the picture of the very lean and well-trimmed cuts). Therefore, you might expect slightly more fat in or around most beef muscles compared to veal. Beef also achieves a more full-bodied flavor with increasing age.

POINT OUT: The charts provide the species name, the wide variety of cuts, the grouping by primal cut (rounds, loin, rib and chuck) and the standardized retail cut names. Many names are similar from one kind of meat (species) to the next.

DISCUSS: Meats in the different species are alike in many ways. Differences are mainly in size and color. Some of the similarities:

1. Anatomy of muscle and bone shapes and location among species.
2. Similar muscles function much the same in each of the species, so tenderness of cuts at a given location are similar. Generally, muscles that work hard in locomotion or respiration are less tender. Those that provide support, such as those along the middle of the back and those along the center section of the hind leg, are more tender.
3. Connective tissue in all species becomes tougher with age.
4. Weights at maturity differ among the species, but fat deposition increases in each species as the animals reach mature size.
5. Within a given animal, individual cuts will differ in leanness. Generally, larger, more active power muscles contain less fat. These are located in the hind portion of the carcass (round, ham, leg).
6. Marbling (flecks of fat in the muscle) is found in varying degrees in beef, pork and lamb. In young animals, marbling has more impact on flavor and juiciness than on tenderness.

DISCUSS: The meat carcass can be divided into six basic areas. (Use beef chart.) These six areas correspond to the major wholesale or primal cuts of a beef carcass with slight modifications for the other species. The simplest way to identify the cuts is through bone shapes. Today, however, many cuts are boneless, but the name of the cut still reflects the carcass and bone location.

- Arm bone—chuck/shoulder cuts
- Blade bone—chuck/shoulder cuts
- Rib bone—rib cuts
- T-bone—loin cuts
- Hip bone—sirloin cuts
- Round bone—leg, round and ham cuts

SHOW: Figure 5. Distinctive muscle shapes also provide clues to meat cut tenderness.

DISCUSS: **Meat Color.** Normal meat color varies depending on species and age of animal. Meat color is also affected by exposure to oxygen in the package, nitrite curing, cooking, spoilage and other causes.

SHOW: Meat color variations. Experiment with storage times and cooking.

DISCUSS: **Meat Cuts.** Terms commonly used for meat cuts available at retail markets include roasts, steaks, chops, slices, cubes and wafered slices. These words give information about cut thickness or size, species and best cooking methods.

Ground meats are available in various fat levels and packaging.

Tenderized cuts and restructured products also are available.

Other options include salted, cured, smoked and variety meats.

HANDOUT: "Primal Cuts of Veal, Lamb, Pork and Beef"

SHOW: Slides or pictures of retail cuts by number and have the group write the numbers in carcass primal area. Review again.

B. Meat Grades/Terminology.

Meat **quality** grades may assist shoppers in making buying decisions. **Yield** grades, however, are designed more for pricing purposes within the meat trade, before meat reaches the retail case.

The U.S. Department of Agriculture (USDA) sets standards for quality (eating quality/palatability) and yield of lean meat in the whole carcass.

USDA quality grades are used for beef, lamb and veal. Pork is not quality graded because pork is much more uniform in age when it is marketed. Generally, people are more concerned about quality grade of beef than of other species.

Animal age and the degree of marbling influence the quality grade. U.S. Prime beef is the most heavily marbled with fat. U.S. Prime, Choice, Select/Good, Standard, Commercial and Utility are the common grades. Consumers are most likely to see Prime on white tablecloth restaurant menus; Choice and Select at retail markets. Of these three grades, Select provides the leanest option of a given cut. These grades are usually found on meat labels. If meat is not labeled, ask the meat department personnel about the grades.

C. Meat Safety-Government, Industry and Consumer Roles.

SAY: Every animal slaughtered to be sold as meat is visually inspected for healthfulness by a government inspector. At slaughter, animals are examined for signs of disease or injury. Seriously ill animals or parts are condemned and not used for food. Various laboratory tests are also performed on selected animals and products to monitor unseen aspects of meat safety and wholesomeness such as drug residues. Meat processors and retailers follow additional guidelines to assure meat safety.

DISCUSS: Responsibility for meat safety continues into the home. Fresh meat is perishable and must be

kept chilled and used within a few days after purchase or it must be frozen if longer storage is desired.

Meat is vulnerable to contamination by food spoilage bacteria or disease-causing bacteria. In instances where there is a slight cause for concern, cooking meat so that no pink color remains (medium, 155° to 160° F) should kill any commonly found problem-causing bacteria in non-cured meat. In cured meat, it has been shown that re-cooking warmed up, abused meat can kill a food-poisoning bacteria (*Staphylococcus aureus*), but its heat-stable toxin will remain to cause food poisoning.

D. Packaging Meat for Consumers.

DISCUSS: Meat packaging varies greatly. Characteristics of packaging include: moisture-resistant, oxygen-permeable/impermeable, puncture-resistant, transparent/opaque, heat-sealable, resealable, inexpensive, recyclable, tamper-resistant, ridged and printable.

SHOW: Examples of packaging types available in retail markets

- Retail fresh meat package
- Opaque chubs
- Modified atmosphere packaging (vacuum or gas flush)
- Freezer packages
- Processed meat vacuum packages

CONCLUDE: Today we have discussed meat cut identification, grading, yields, inspection and packaging. This information will be useful as you make meat purchases.

Handouts

- Meat Cut Selection Knowledge: Pre-Post Test
- Veal-Retail Cuts
- Beef-Retail Cuts
- Lamb-Retail Cuts
- Pork-Retail Cuts
- Primal Cuts of Veal, Lamb, Pork and Beef



Meat Cut Selection Knowledge

Unit 1, Pre-Post Test

Code/Name _____

Number _____

Circle true or false.

1. T F Lamb is lighter colored than pork.
2. T F Veal color is quite similar to beef color.
3. T F Vacuum packaged beef is bright cherry-red in color.
4. T F All meat animals have similar muscle shapes.
5. T F "Support" muscles tend to be less tender than "action" muscles.
6. T F Meat from old animals is the most tender.
7. T F Cuts from the shoulder area have the least fat.
8. T F A beef flank steak is leaner than a shoulder blade steak.
9. T F Spare ribs have more servings per pound than a pork loin chop.
10. T F Variety meats are fatter than most regular meat cuts.
11. T F Bright cherry-red beef is definitely fresher or younger than purplish-red beef.
12. T F Ground round should be leaner than regular ground beef.
13. T F Curing meat involves the addition of salt and very small amounts of nitrite.
14. T F Muscles from beef round steak are all equally tender.
15. T F Cuts with more marbling will have more calories.
16. T F Cured and smoked ham has more sodium than fresh ham.
17. T F Trimming away all visible fat can greatly reduce total caloric content of a meat cut.
18. T F Aged meat means it comes only from old animals.
19. T F Polyvinyl chloride film is bad for meat.
20. T F Cuts with low degrees of marbling still cannot meet reduced-fat health recommendations.

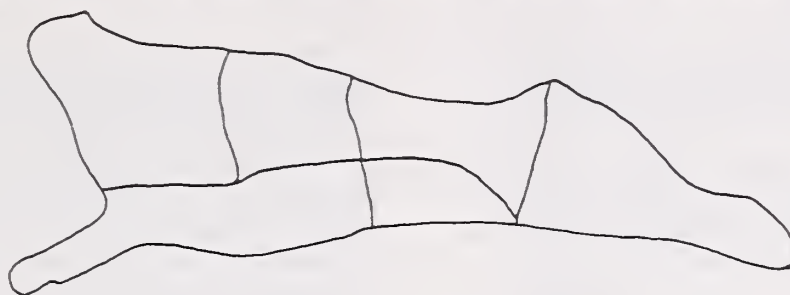
SELECTION

Meat Cut Selection Knowledge Key: Unit 1

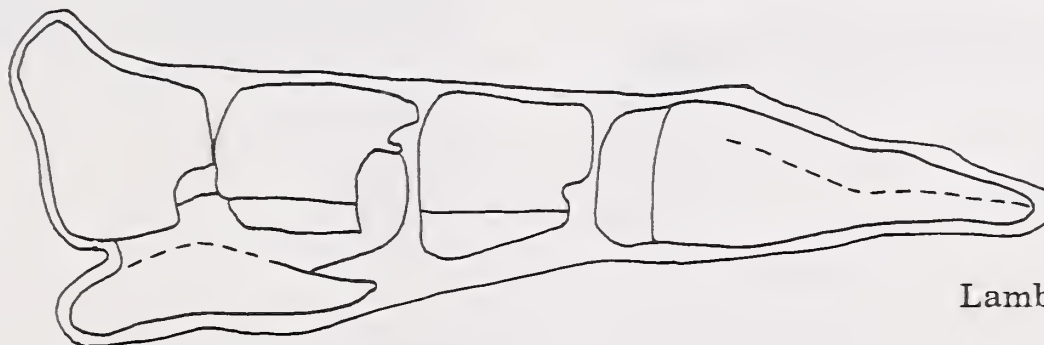
(Do not distribute until post-test is given.)

1. F Pork is grayish-pink and lamb pinkish-red.
2. F Veal is much lighter in color.
3. F Vacuum packaged beef is purple-red in color.
4. T
5. F "Support" muscles are more tender than "action" muscles.
6. F Meat from old animals is the least tender.
7. F Cuts from the shoulder area have medium fat.
8. T
9. F Spare ribs have much less servings per pound.
10. F Almost all are less fat.
11. F Both may be very fresh.
12. T
13. T
14. F Top round and tip are more tender.
15. T
16. T
17. T
18. F Aging refers only to the length of time of refrigerated storage of meat to allow enzymatic tenderization, not the animal's age.
19. F Polyvinyl chloride keeps meat moist, protects it from contamination and allows oxygen inside to brighten its color.
20. F Acceptance depends on degree of marbling to some extent. However, if trimmable fat is removed, meat with low marbling levels (less than 5 percent fat) can meet reduced-fat recommendations.

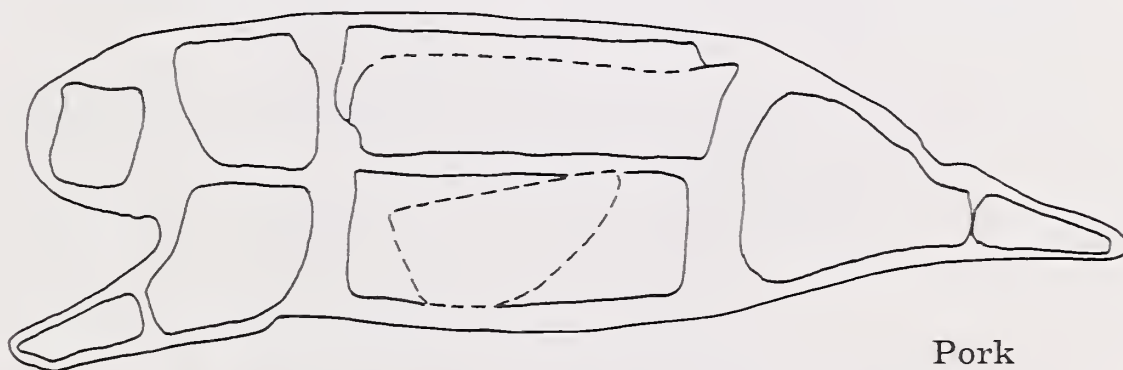
Primal Cuts of Veal, Lamb, Pork and Beef



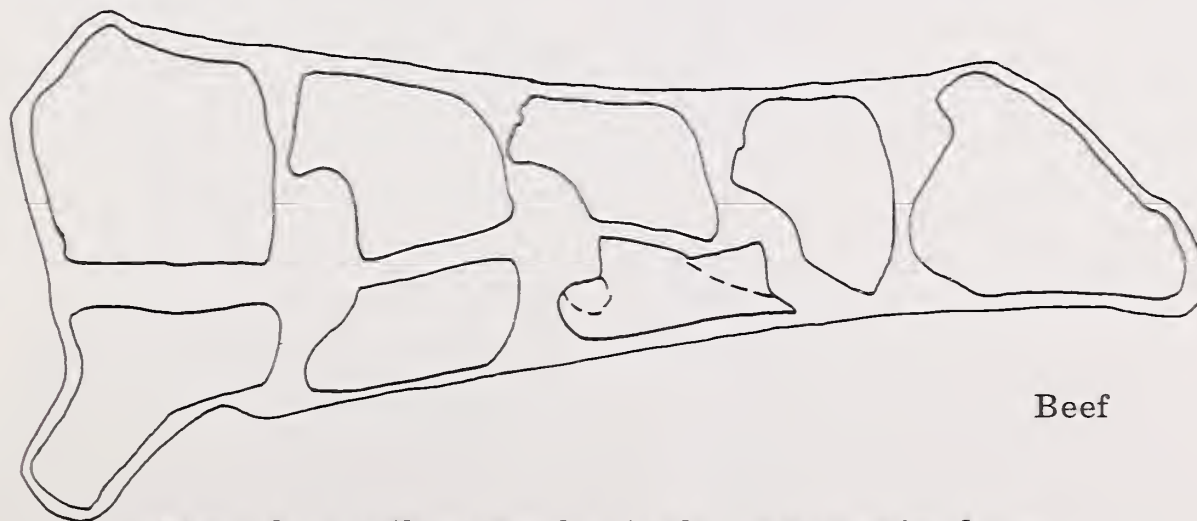
Veal



Lamb



Pork



Beef

Place the retail cut number in the correct primal cut.

SELECTION

Suggested Learning Experiences

1. Use existing charts, pamphlets, models, etc., produced by cooperating trade organizations, health organizations, universities or government agencies if they are accurate, effective and help accomplish efficient learning of the subject. The National Live Stock and Meat Board, with representation from all segments of the industry, has a long-standing tradition of especially outstanding resources related to this Unit. Other related resources are listed in the supplementary resources.
2. Bring in actual retail cuts of meat as visual aids. Discuss the location on the carcass for each cut and the leanness.
3. Compare actual retail cuts of boneless and bone-in meats as a consumer would find them in the store. Perhaps compare to answers calculated using the Yield Test handout.
4. Experience colors, aromas and tastes to heighten interest and emphasize principles.

Supplementary Resource Materials

American Lamb Council (ALC/ASPC)
200 Clayton Street
Denver, CO 80206

- American Lamb Compared to Imports (1/1986)
- American Lamb: Finest for Food Service (5/1987)
- How to Cut a Fresh American Leg of Lamb for Variety and Economy
- The New Look of American Lamb (1/1986)

American Meat Institute (AMI)
P.O. Box 3556
Washington, DC 20007
(703) 841-2400

- FMI Meat Nutri-Facts Customer Survey (1988)
- Lower Conversion Factor Distorts Beef Consumption Comparisons AMI Newsletter (9/15/89)
- Meat Facts (1989)

Illinois Beef Council-Illinois Pork Producers Council (IBC-IPPC-AHA)
993 Clock Tower Drive
Springfield, IL 62704
(217) 793-3535

- How to Live High on the Hog and Steer Clear of the Fat

Kansas State University (KSU)
David E. Schafer
Extension Specialist, Meats
AS&I-Weber Hall
Kansas State University
Manhattan, KS 66506-0201
(312) 467-5520

- Barbecueing Meat Outdoors-Schafer, (1978)
- Cost-Per-Serving KSU, UFL HE8008
- Kansas Family Survey Results (2/1988)
- Meat Cookery-Schafer, (1978)

- Meat Educational Resources Inventory, (6:90)
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National Academy of Science (NAS)
National Academy Press
2101 Constitution Avenue, NW
Washington, DC 20418

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National Dairy Board (NDB)
2111 Wilson Blvd. Suite 600
Arlington, VA 22201
(703) 529-4800

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National Live Stock and Meat Board
444 North Michigan Avenue
Chicago, IL 60611
(312) 467-5520

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- Cooking Today's Beef (video and kit with teacher's guide) 17-723 (1989)
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National Pork Producers Council/ Women NPPC/MPCW
P.O. Box 10383
Des Moines, IA 50306
(515) 223-2600

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- Dr. Sherlock Hog
- Food for Thought: The Other White Meat
- Hog Wash
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- Pork Recipes

North Carolina State University (NCSU)
N.C. Agricultural Extension Service
Dept. of Agricultural Communications
Raleigh, NC 27695

- Best Food Buys: Selecting Meat (Chicken, Round Steak, Boston Shoulder Picnic) (videotape)

North Dakota State University
NDSU Extension Service
Publications Office
Fargo, ND 58105
(701) 237-7251 (Pat Beck)

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**United States Department of Agriculture
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Washington, DC 20250**

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**University of Arkansas (U of A)
Cooperative Extension Service
P.O. Box 391, 1201 McAlmont
Little Rock, AR 72203
(501) 373-2500**

- Beef: Fast Food for Busy People (1988)
- Beef: Separating Fact From Fiction
- Wise Choices at the Meat Counter

**University of Florida (UFL)
Cooperative Extension Service
Publications Office
Gainesville, FL 32611**

- Balance Your \$\$\$ and Diet Toward Zero Food Waste UFL-HE 8073
- Cost Per Serving KSU, UFL-HE 8008
- Meat and Meat Alternates UFL-HE 8073

**University of Georgia (UGA)
Cooperative Extension Service
Publications Office
College of Agriculture
Athens, GA 30602**

- Cleaning, Sanitizing and Pest Control in Food Processing, Storage and Service Areas #927 (10/1986)
- Food, Hands and Bacteria #693 (5/1986)
- Food Spoilage and You #906 (3/1987)
- Maintaining Food Quality in Storage #914 (2/1987)
- Preventing Food Poisoning and Infection #901

- Sausage and Smoked Meats # 865 (4/1985)
- What Are Bacteria, Yeasts and Molds? #817 (12/1983)

**University of Illinois (UIL)
Cooperative Extension Service
Publications Office
Urbana, IL 61801**

- Meat and Meat Alternates: 4-H Member's Manual ME0336

**University of Kentucky (UKY)
Cooperative Extension Service
Publications Office
College of Agriculture
Lexington, KY 40546**

- Ground Beef: Know the Difference

**University of Minnesota (UMN)
Minnesota Agricultural Extension Service
Publications Office-Coffey Hall
St. Paul, MN 55108**

- Amount of Fat and Cholesterol in Meat UMN AG-FO 0682 (1987)
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- Dark Cutting Beef (video, kit and teacher's guide) 17-723 (1989)
- Determining USDA Carcass Grades 376 (1978)
- Meat Tenderness UMN AG-FO 0856
- Retail Meat Cut Selection and Storage UMN AG-FO 0823

**University of Nebraska (UNE)
Cooperative Extension Service
Publications Office
College of Agriculture
Lincoln, NE 68583**

- Large Quantity Barbecue, The UNE Ext. EC 69-221 (8/1969)

University of Wisconsin (UW)
Extension-Agricultural Bulletin
30 N Murray Street
Madison, WI 53715
(608) 262-3346

- Focus on Ground Beef 87-2
- How Much Red Meat Do Americans Really Eat? ME 87-1
- Information About Cholesterol in Muscle Foods
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Virginia Polytechnic Institute
(VPI/Va Tech)
Cooperative Extension Service
Publications Office
Blacksburg, VA 24061

- Beef Fabrication 200-500-12
- Fabrication of Pork Cuts 200-500-12
- How Are Beef Prices Determined? 200-500-4
- What Is a Beef Carcass Worth? 200-500-15
- What You May Want to Know About Ham and Other Cured Meats 200-500-10
- What You May Want to Know About Sausage 200-500-16
- What You Should Know About Beef 458-009 (3/1987)

Evaluation Instrument

Evaluation of the concepts learned by participation in Module III, Unit 1 can be accomplished by use of a pre-post test. At the first meeting, ask participants to complete the "Meat Cut Selection Knowledge" test. Assure them they won't be "graded" and results will be confidential. Review the completed tests, and summarize the knowledge strengths and weaknesses for special emphasis during the Unit. Keep the tests.

At the last meeting, or by telephone 3 to 6 weeks after the last meeting, repeat the test for all or a representation of the participants. Perhaps volunteers could help with calling. Compare pre- and post-test scores to measure individual knowledge gain. Survey how many learners purchased different cuts the weeks following the lesson as a result of their new knowledge. Have they changed any eating patterns as a result of this lesson? What did they feel helped them the most? Would they do it again? Are there any other related subjects they'd like to learn about?

Optional method: If the call-back method is too complicated, have participants keep their pre-test with circled answers through the lesson. At the conclusion, have them re-take the same exam, placing an (X) over any changed answers, and giving a short explanation for the change. If they wish to return the evaluations, code/name them and collect. You now have a quick measure of their knowledge base before and after Unit 1.

Keep the records of your pre-post tests for program evaluation.

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Unit 2. Shopping for Lean Meat

Contents

	Page
Objectives	35
Concepts	35
Background Information	36
• Life Stage Considerations, Nutritional Needs	36
• Budget Considerations	36
• Buying Strategies	37
• Cost-Value Considerations	42
• Names and Labels for Retail Meat Cuts	43
• Nutri-Facts	46
• Trade Organizations, Extension Service, Government, Private Companies	48
• Computer-aided Meat Shopping	48
Leader Lesson Plan	49
• Advance Preparation Guide	49
• Presentation Guide	50
Handouts	53
• Meat Shopping: Pre-Post Test	
• Check Out Your Meat Counter Choices	
• Decision-tree for Meat Buying	
• Servings of Meat Per Pound	
• Meat Buying Aids	
• A Buyer's Guide to Cost Per Serving of Meat	
• Meat Cutting Yield Test and Price Comparison	
Suggested Learning Experiences	54
Supplementary Resource Materials	55
Evaluation Instrument	56
References	57



Unit 2. Shopping For Lean Meat

Objectives

After completion of this lesson, consumers will be able to:

- 1 Demonstrate ability to select a variety of lean meat cuts and products appropriate for their nutritional needs at different life stages or health situations.
- 2 Fit a week's recommended minimum lean meat servings for all household members into a weekly food budget.
- 3 Understand fresh meat standardized labeling.
- 4 Understand price per pound, cost per serving, and cost per gram of protein with a nutritomic (cost of a nutrient) comparison.
- 5 Evaluate trade-offs among "cut your own" subprimals, regular bone-in cuts, closely trimmed boneless retail cuts of common grades and low fat or "natural" alternatives.
- 6 Determine "best buys" of lean, whole muscle cuts and fresh ground meats for various situations.
- 7 Find reliable sources of information which address meat selection questions and concerns.

Concepts

- 1 Numerous life situations (social, economic, religious, health and personal preferences) affect the decision to buy and eat meat.
- 2 Many lean meats can compete favorably with other foods on a cost basis as sources of protein, iron, zinc and the B vitamins thiamin, niacin, B₆ and B₁₂.
- 3 Edible yield per pound of meat varies from cut to cut. Servings per pound charts assist in deciding amounts to purchase.
- 4 Prices of lean meat cuts vary sufficiently with prices low enough that most consumer budgets can include two 3-ounce cooked servings of meat per person per day.
- 5 Meat departments have product wholesale costs, plus operating overhead costs, and hopefully, a small profit to achieve from the meat sold. Meat is priced so each cut is perceived as a value to enough customers to "move" a balanced amount of product.
- 6 Price-per-pound is most commonly used to buy meat. However, bone and fat content, added water in cured meats or moisture and fat lost in cooking affect food value received. Cost per standard-sized serving is more useful than price per pound in determining value received. Cost per gram of protein or other high-valued nutrient(s) can give another even more precise value comparison.
- 7 The Uniform Retail Meat Identity Standardized system (URMIS) of fresh meat labeling has been adopted nationally to anatomically name most fresh meat cuts to assist in purchase selection.
- 8 "Nutri-Facts" labeling or other standardized regulations or guidelines can assist in assessing leanness and nutritional content.
- 9 The Government, trade organizations, educational groups and private companies will continue to develop new ways to communicate important information to meat shoppers.

Background Information

Life Stage Considerations, Nutritional Needs

The reasons to include lean meat in a healthful diet may change somewhat at different life stages. Yet, the basic fact remains, moderate portions of lean meat provide significant amounts of several important nutrients with limited calories for any life stage. Consult Module II, Meat, Nutrition, and Your Health for detailed nutritional information. The following summary is designed to highlight, in a generalized way, some important considerations. Aside from the palatability considerations related to lean meat, nutritional considerations appear to be the focus of many consumers.

Lean meat is well suited to the needs of active young children to supply the essential nutrients for growth and some calories for energy. Young athletes may rely on the nutrient density of lean meat as a part of their diet. The essential amino acids in meat protein and other nutrients such as iron and zinc are extremely important to support the needs of these active, growing groups.

Adults, in general, and the elderly in particular, may also rely on lean meat in a balanced diet to satisfy nutritional needs while controlling caloric intake for acceptable body weight maintenance. A cooked lean portion of meat, weighing approximately 3 ounces, contributes less than 200 calories to the diet yet supplies an important blend of protein, iron, zinc and B vitamins.

Even though heart and circulatory diseases are our nation's number one health concern, and obesity is a serious national problem, most public attention has focused rather narrowly on reducing consumption of dietary cholesterol and saturated fatty acids as the answer to better circulatory health. Blood cholesterol levels can be manipulated by diet, therefore persons with high (greater than 220 milligrams per deciliter) blood cholesterol counts should consult their physician, who may recommend restricting cholesterol intake. Whether fat is saturated or unsaturated, fat consumption should be limited. It is recommended that no more than 30 percent of one's calories be consumed as fat. Many lean meat cuts contain only 4 to 7 percent fat and 65 to 75mg of cholesterol per 100g

(3 1/2 ounces) of lean, allowing its daily consumption in almost any diet according to current recommendations.

Because some (mainly cured or restructured) meat products contain salt, sodium intake should also be considered. Normal, healthy individuals can include salt-cured meat in a balanced diet whereas consumers on sodium-restricted diets should consume only very limited amounts of cured-meat product. New, lower salt-cured meats may provide more alternatives for consumers trying to reduce salt intake while enjoying cured meat flavor and convenience. Fresh, non-cured meat is very low in sodium and can be included in a low sodium diet.

The female need for iron exceeds the male need and extends through several stages of adolescent and adult life. Lean meat is a concentrated source of biologically available iron for the special needs of the reproductive-age female.

Budget Considerations

The consumer's decision to serve meat (Yankelovich, Skelly and White, 1987) is determined primarily by convenience, taste and economics (cost and value). Approximately 28 percent of those surveyed strongly agreed with the statement "I don't let price govern my food purchase decisions." In contrast, approximately 16 percent strongly agreed with the statement "When I economize, the grocery store is the first place I limit spending." Twenty-two percent of the consumers surveyed were classified as "price-driven" consumers. Therefore, financial status and budget considerations still play a key role in consumer meat purchase decisions.

The creation of a wide range of marketplace options allows consumers maximum flexibility in matching meat products priced within their economic budget to their dietary and lifestyle needs. Budget options consumers might follow include:

- Limited budgets with minimal allocations for food purchases can meet their dietary goals by careful selection of lower-priced meat

products with high nutritional value. Generally, variety meats and cuts high in connective tissue are available at lower prices. The palatability and acceptability of these meat products can be enhanced by increasing value through further processing (grinding) and cookery procedures (moist-heat cookery).

- Intermediate food level budgets have more flexibility and options than those on limited budgets. Large quantity purchasing, further fabrication and a larger range of potential meat product and cookery options are available to these consumers.
- Non-restricted food budgets have maximum flexibility and the largest range of potential product purchases. They can place a higher value on convenience (pre-cooked, dry-heat cookery, portion-control, etc.) and taste (tender, low connective tissue, flavorful and juicy cuts). Value-based purchases of lean meats that meet dietary goals are possible for almost all budget levels.

Buying Strategies

Shopping is enjoyed by many consumers and abhorred by others. Methods people use to shop are as varied and individualized as the people who use them, their budgets, and their situations.

How people approach meat shopping depends to a great extent on whether they are shortest on time, money or meat.

The most tender lean cuts are regularly available, but usually at a premium. Sometimes these premium cuts are well worth the price if you are short on preparation time, want a wonderful eating experience and your budget can afford them. To make other cuts leaner or more tender usually requires additional labor in trimming, mechanical treatment or special (perhaps longer) cooking to tenderize the meat, all of which require time or add to the cost of the meat.

Several very satisfactory alternatives to the most tender, leanest cuts are available in the market as you consider price and value received. Their shortcomings might be a larger quantity or size than needed, a less convenient form (e.g., containing bone), more fat than desired or alternate cooking procedures required.

With a small investment of time and ingenuity, you may be able to convert lower cost cuts into very desirable cuts.

In this country with pre-priced food, we don't normally have the opportunity to bargain over every food purchase like shoppers in much of the world. In some countries, consumers must stand in line waiting for their limited ration of staple foods without even an opportunity to negotiate.

Food purchasing can be a fun game, a challenge to match wits with those in the food business by becoming a smarter shopper, while at the same time communicating important market signals verbally or through selective purchase decisions if we're not finding what we need or want. Because we have so many choices, very competitive markets are poised to respond to our collective signals.

Meat shopping methods might be categorized into the following types:

1. **Standard routine.** Similar to purchasing a gallon of milk or a loaf of bread every time you enter the grocery store, some consumers might buy a package of ground beef or hot dogs (our national favorite) to have on hand for planned meals or unplanned emergencies. Sometimes these routines are repeated on a daily, weekly or monthly basis.
2. **Organized meal-planning, recipe-based purchasing.** Specific meat cuts in certain amounts are sought out and bought, almost irrespective of price. In some cases, the method of cookery may be chosen first to set the mood for the meal: broiling outdoors for a relaxed entertaining atmosphere; fondue pot cooking for a hearty, flavorful wintertime bite-size snack item; or oven roasting for a formal, sit-down, white tablecloth meal. Leftovers also fit into this planned meal category. A unique example is to have a summer and winter meal plan for one month. Purchase meat in one trip and sack each week's menu in a separate sack. This eliminates impulse buying and because all the meat is frozen, flexibility can remain.
3. **Advertised/unadvertised special.** In a sense, this method allows the market to determine your menu. Because every

meat carcass contains certain proportions of each cut, specific fresh meat cuts are "specialized" (reduced in price) to move them through the market system faster to avoid back up and maintain freshness. Retailers choose to "special" certain cuts to attract customers to their stores, and hopefully sell other products along with the meat at a good profit margin to make up for lost margins on specialized meat items. Customers searching newspaper ads and making store visit decisions on this basis are economy-driven.

To shop specials well, shoppers must sharpen their value judgment skills. Everything that is cheap is not always a good buy. A shopper must be astute at judging real versus perceived values. This type of shopper must also be somewhat resourceful in food preparation with a cooperative family to eat and enjoy the "experiments" the market has thrust upon them. Really good specials may warrant buying several to freeze for later use. Choosing to do this will require freezer space and freezer management skills, too.

4. **Quantity purchases.** Quantity purchases are often made because they are assumed to be economical. Buying a side of beef or a whole hog or lamb may sound economical and self-sufficient, but serious consideration should be given before investing in more than one to two month's meat supply. Two big requirements for quantity purchases are to have a large home freezer and up-front cash or credit to purchase the meat. There are reasons why certain consumers may choose large quantity purchases that will last them three months to one year. However, most consumers will do best if they limit purchases for frozen storage to a one- to two-month supply. Depending on household size and whether many meals are eaten away from home, a one- to two-month supply may range from 15 to 100 pounds. Options requiring limited, up-front cash or credit include:

- a. *Meat bundles* (25 to 50 pounds) with a broad selection of cuts. Care should be given to the mixture and amounts of each cut to see if the bundles are really an economical buy.

- b. *"Cut your own"* vacuum-packaged beef, pork or lamb primal/subprimal cuts which can be "aged" in the bag a suitable time and cut into individual cuts, some for immediate use and the remainder frozen for later use. Care must be given to your purchase choice to see that the large cut does not contain excessive fat for its type of cut. The thick vacuum package with loose meat juice obscuring the meat surface sometimes makes it difficult to see how much fat is present.

Shoppers may need to feel several bags and avoid the harder, thicker fat covers on some cuts. A well selected subprimal has the potential to save 10 to 20 percent on the cost of comparable retail cuts, not counting labor. Cuts like these allow one to "age" meat longer than regular retail cuts for increased tenderness. Virtually no spoilage or shrinkage should occur if the unopened product is kept well refrigerated (under 36°F) and used or frozen within three to four weeks of the original packaging date. Ask the meat retailer for this date if it is coded or not on the package. Avoid bags that contain milky white fluid or with plastic that pulls away from the meat. These "leakers" have allowed air back into the bag and can spoil rapidly.

- c. *Ground beef chubs* (3- to 5-pound tubes) are often economical buys. They can easily be cut at home into meal-size portions and frozen in freezer bags or polyethylene bread sacks, separated by "twist-ties" with little mess or bother and stored for one to two months.

Patties can also be hand-formed and frozen briefly on a cookie tray and freezer bagged for later convenient use. They may even be pre-grilled (medium-rare, slightly pink center), quickly cooled and frozen in freezer bags for quick microwave rewarming later that week. Meat for several meals could be prepared in advance at one time.

- d. *Family packs* of retail cuts at a slightly discounted price provide some opportunity for money saving, but often are very difficult to judge. If many cuts are stacked together, the bottom cuts could be less desirable than those on top. Only after some experience in individual stores can you judge if this is a good buy.

5. **Out-of-date price mark-downs.**

Consumers must be especially careful on each individual purchase to assess quality and questionable food safety of such purchases. Just because it's marked down doesn't make it a wise buy. Some products might be frozen by the retail store as they're going out-of-date to keep them from spoiling. Buying these products might be called economic opportunism, taking advantage of the system's failure to sell the product at its peak of freshness, but it does involve some risk of misjudgment.

6. **Impulse shopping.** Without investing preparatory time or effort, many people (61 percent) wait to make their buying decisions until they're in the store. With a little experience, good decisions can be made on the spur of the moment if distractions are minimized. This method allows for occasional venturing into uncharted territory to try something new (experiential cooking), or to take advantage of unadvertised specials. Handy recipes or other advice on how to use new cuts will help the chances of succeeding in these ventures.

Some attendant risks are: a) Prices may be high relative to other cuts or other stores. b) Quantities may be wrong for

your needs—if too little, add another course to your meal and parcel out smaller portions of meat, or if too much, plan for "left overs." (Avoid the temptation to "clean everything up," just because it was so good, or you don't want leftovers. Overconsumption, even though satisfying at the time, defeats your best efforts at weight control and nutritional balance.)

7. **Meat supply at home considerations.**

The amount of meat remaining at home in the refrigerator or freezer governs the advisability of new meat purchases. Managing the rotation of your stocks, to keep the home supply fresh and to minimize waste, is a challenge in itself. It requires organization, marking dates and keeping an inventory, either a mental or systematic in-out accounting. Purchase of a freezer and its cost of operation for food storage are often overlooked costs.

8. **Budgeted allowance per week or month for meat.** Some consumers start with a certain allowance for food store purchases (sometimes including non-food items), and try to live within the flexibility or restraint that approach allows. Meat, as a substantial part of most food budgets, could be specifically budgeted in the same way.

9. **"Servings per pound"** lists for many cuts have been devised to help consumers quickly decide how much meat to buy for a meal. Servings per pound charts for selected beef and pork cuts are based on 3 ounces of cooked nutrient-dense, lean meat per serving (Table 1, beef and veal; Table 2, pork and lamb). Since not all cuts are the same leanness, some adjustments are incorporated in the recommended table values. Generally, for a cooked, boneless, higher salt and fat product such as bacon, serving size is reduced yielding 6 servings per pound. (See Tables 1 and 2.)

Table 1. Servings per pound chart

BEEF

Roasts	Number of Servings*	Pot Roasts	Number of Servings*
Rib Eye Roast	3	Arm Pot Roast, Chuck	2
Rib Roast	2	Blade Roast, Chuck	2 1/2
Rump Roast, Round	2	Bottom Round Roast	3
Rump Roast, Boneless, Round	3	Cross Rib Pot Roast, Chuck	2 1/2
Tip Roast, Round	4	Heel of Round	2
Top Round	3	Shoulder Pot Roast, Boneless	2 1/2
Eye of Round Roast	4		

Broiling Steaks

Cubed Steak	4
Flank Steak	4
Porterhouse Steak, Loin	2 1/2
Sirloin Steak	3
Rib Eye Steak	3
Rib Steak	2
Rib Steak, Boneless	2 1/2
T-Bone, Loin	2
Tenderloin (filet mignon) Steak	3
Top Loin Steak	2
Top Loin Steak, Boneless	3
Top Round	4

Braising Steaks

Arm Steak, Chuck	2 1/2
Blade Steak, Chuck	2 1/2
Flank Steak	3
Round Steak	3
Tip Steak, Round	3

Other Cuts

Beef for Stew	4
Brisket	3
Ground Beef	4
Short Ribs	2
Beef Variety Meats (tongue, heart, brains, sweetbreads)	
Liver, kidney	4

VEAL

Chops, Steaks and Cutlets

Loin Chops	2
Rib Chops	2
Round Steak	3 1/2
Shoulder Steaks	2 1/2
Cutlets, boneless	2 1/2

Roasts

Leg	3
Shoulder, boneless	3
Rib Roast	2

Other Cuts

Riblets	1 1/2
Cubes	4
Boneless Breast (rolled)	3
Ground	4

*Number of cooked servings (3-ounce) per pound from various cuts
The Meat Board's Lessons on Meat (1990)

Table 2. Servings per pound chart

PORK

	Number of Servings*		Number of Servings*
Roasts		Other Cuts	
Leg (Fresh Ham), Bone-in	3	Back Ribs, Loin	1 1/2
Leg (Fresh Ham), Boneless	4	Bacon (Regular), sliced	6
Smoked Ham, Bone-in	3	Canadian-Style Bacon, Loin	5
Smoked Ham, Boneless	4 to 5	Country-Style Back Ribs	1 1/2
Smoked Ham, Canned	4 to 5	Country-Style Loin Ribs	2
Loin Blade, Bone-in	2	Cubes, Various	4
Top Loin (Rolled), Boneless		Hocks (Smoked or Fresh)	1 1/2
(Smoked or Fresh)	3 1/2**	Pork Sausage	4
Center Loin	3	Spareribs	1 1/4
Smoked Loin	3	Tenderloin	4
Sirloin	2 1/2		
Arm Picnic Shoulder (Bone-in)		Variety Meats	
(Smoked or Fresh)	2	Brains	5
Smoked Shoulder Roll	3	Heart	5
Blade Shoulder Boneless		Kidney	5
(Smoked or Fresh)	3	Liver	4
Chops and Steaks			
Blade Chops or Steaks	2 1/2 to 3 1/2		
Boneless Chops, Loin	4		
Loin Chops	2 1/2		
Rib Chops	2 1/2		
Smoked (Rib or Loin) Chops	2 1/2		
Smoked Ham (Center Slice)	3 1/2		

LAMB

Chops and Steaks		Roasts	
Leg Center Slice	3	Leg, Bone-in	2 1/2
Loin Chops	2 1/2	Leg, Boneless	4
Rib Chops	2 1/2	Shoulder, Bone-in	2
Shoulder Chops	2	Shoulder, Boneless	3
Sirloin Chops	2		
		Other Cuts	
		Breast	2
		Riblets	1 1/4
		Cubes	4
		Shanks	2
		Ground	4

* Number of cooked servings (3-ounce) per pound from various cuts
 ** AMERICA'S CUT †, CHEF'S PRIME † comparable
 The Meat Board's Lessons on Meat (1990)

Cost-Value Considerations

Meat marketing still involves products with some biological variation that cannot be entirely controlled. Therefore, value differences will still exist beyond the price per pound on most meats in the store.

1. **Price per pound.** Various means are used to price foods, but by far the most common is price per pound. Many stores with unit pricing systems may also display price per ounce for shoppers to compare. Other food market systems may use price per unit; for example, per head of lettuce, per steak, per live lobster, etc.; price per volume; for example, per gallon of ice cream, per loaf of bread, or some other creative means of pricing. But, relatively low-priced and versatile modern scales make it possible to weigh nearly every thing, so weight has become the dominant method for pricing. Also, food marketing trade laws have moved food pricing in this direction. Individually printed labels with product name, price, UPC bar codes and helpful information are now widely available with the more sophisticated weighing devices.

2. **Cost per serving.** Several additional variables still affect the nutritive or "use" value of meat cuts when purchased on a price per pound basis. Some of these "value" variables in fresh meat are the amount of bone, fat and connective tissue, relative tenderness, and convenience to carve, serve or eat.

To help make price comparisons on an actual food nutrient basis, servings per pound and cost per serving charts have been devised. These charts are based on simple cutting yield tests where the cut, as purchased, is further trimmed down to the edible lean. From these cutting yield tests, each cut is determined to have a certain number of standard-size servings. Concerning meat, the standard serving size of the Recommended Daily Allowance (RDA) is a 3-ounce cooked, lean meat serving. To account for cooking losses (shrink), this 3-ounce serving size starts as 4 to 5 ounces of raw meat.

The servings per pound (Tables 1 and 2) and cost per serving charts (Table 3) are guides to conveniently provide the results of numerous cutting yield tests. To affirm their value, individuals may wish to conduct their own cutting yield tests on a few selected cuts. From these exercises, you can understand the principles used to devise the charts.

Table 3. A buyer's guide to cost per serving of meat^a

Servings per pound (3-ounce cooked)	Price per pound, \$											
	1.49	1.99	2.49	2.99	3.49	3.99	4.49	4.99	5.49	5.99	6.49	6.99
1 1/2	.99	1.33	1.66	1.99	2.33	2.66	2.99	3.33	3.66	3.99	4.33	4.66
2	.75	1.00	1.25	1.50	1.75	2.00	2.25	2.50	2.75	3.00	3.25	3.50
2 1/2	.60	.80	1.00	1.20	1.40	1.60	1.80	2.00	2.20	2.40	2.60	2.80
3	.50	.66	.83	1.00	1.16	1.33	1.50	1.66	1.83	2.00	2.16	2.33
3 1/2	.43	.57	.71	.85	1.00	1.14	1.28	1.43	1.57	1.71	1.85	2.00
4	.37	.50	.62	.75	.87	1.00	1.12	1.25	1.37	1.50	1.62	1.75
5	.30	.40	.50	.60	.70	.80	.90	1.00	1.10	1.20	1.30	1.40
6	.25	.33	.42	.50	.58	.67	.75	.83	.92	1.00	1.08	1.17

^a Adapted from Rawls, Walker and Schafer (1983).

3. **Cost per gram protein** (Or cost per 20g protein puts it on an approximate recommended serving size basis for those foods considered to be major protein sources. Quick and easy comparisons can be made.)

Comparable boneless, closely trimmed fresh meat cuts of beef, pork and lamb will not differ much in protein content; therefore, cost per serving comparisons are normally sufficient. However, to compare fresh meat with processed meats, other flesh foods and the non-meat foods we buy, a cost per gram protein exercise often is enlightening. Some foods that seem expensive are excellent values. Some foods, seemingly low-priced, become expensive when compared on their nutrient content. A comparison on this basis must be viewed with some caution when a food is evaluated on only one nutrient at a time. One should ask the basic question, "Why is this food in the diet?" "What is it expected to contribute in an overall balanced diet?" "Are we comparing it fairly, or on its most favorable or least favorable characteristics?"

The concept embodied in this comparison is nutrient-density. Foods that are nutrient-dense contain more valuable nutrients compared to calories. In small servings, nutrient-density is a valuable asset. Lean meat is generally considered to be nutrient-dense, because it contains significant amounts of high quality protein (all essential amino acids), iron (especially heme-iron), zinc and the B vitamins niacin, thiamin (especially pork), B₆ and B₁₂, relative to the calories it provides.

Even though meat may sometimes seem expensive, it usually provides good-to-excellent value on a nutrient basis. (Refer to Module II for more information on the nutritive value of meat.)

Names and Labels for Retail Meat Cuts

To assist in learning the system, a meat retail cut (selected) master list is found in Table 4. It includes:

- Species
- Primal cut
- Retail cut name
- Form or processing method
- Recommended cookery method, dry or moist (D or M)

While this list of meat cuts is a good resource, the meat shopper can find all he/she needs to know in the information presented by most meat sellers through their labeling system. In 1973 industry leaders, coordinated by the National Live Stock and Meat Board, agreed to a standardized anatomically-based retail meat cut naming system. Most retailers today use all or a major part of that voluntary system (a few states require it to be used). The Uniform Retail Meat Identity Standards (URMIS) employ three main features plus a few optional features. (See Figure 1 for an example of a meat label.) Note the species, primal cut and the approved retail cut name (generally, anatomically-based). Optional information that may appear on the label is a recommended cookery method and a freshness date. Sometimes fanciful names are also added to aid in local identity or to give a retailer something to feature or promote. The fanciful name occasionally incorporates a recommended method of cookery as well, such as patio chops, chuck-wagon cut or London broil.

Table 4. Meat retail cut master list, selected common cuts

BEEF Retail Cut Name	Recommended Cookery Method	PORK Retail Cut Name	Recommended Cookery Method
Chuck Arm Pot Roast	Moist	Shoulder Arm/Blade	
Chuck Arm Steak	Moist	Roast/Steak	Dry/Moist
Chuck 7-bone Pot Roast	Moist	Smoked Shoulder Picnic	Dry/Moist
Chuck Blade Roast/Steak	Dry/Moist	Loin Roast/Chops	Dry/Moist
Chuck Shoulder Roast,		Loin, Country Style Ribs	Dry/Moist
Steak, Boneless	Moist	Loin, Tenderloin Whole	Dry/Moist
Chuck Top Blade Roast/		Smoked Loin Chops	Dry
Steak, Boneless	Moist	Smoked Canadian	
Chuck Under Blade		Style Bacon	Dry
Roast/Steak, Boneless	Dry/Moist	Bacon	Dry
Chuck Mock Tender	Moist	Spareribs	Dry/Moist
Chuck Eye Roast, Boneless	Dry/Moist	Fresh Ham, Whole, Boneless	Dry
Shank, Cross Cuts	Moist	Fresh Ham, Center Slice	Dry/Moist
Brisket, Point/Flat		Smoked Ham	Dry
Half, Boneless	Moist	Smoked Ham, Boneless	Dry
Flank Steak	Dry/Moist	Smoked Ham, Center Slice	Dry
Rib/Ribeye Roast/Steak	Dry	Smoked Pork Jowl	Moist
Loin, Top Loin Steak, Boneless	Dry	Cubed Steak	Dry/Moist
Loin, T-bone Steak	Dry	Ground Pork	Dry
Loin, Top Sirloin		Sausage	Dry/Moist
Steak, Boneless	Dry		
Loin, Tenderloin Steak	Dry	LAMB Retail Cut Name	Method
Round Steak	Dry/Moist		
Round, Heel of	Moist	Shoulder Chops	Dry/Moist
Round, Top Roast/Steak	Dry	Breast	Dry/Moist
Round, Bottom Roast	Dry/Moist	Shank	Moist
Round, Bottom Steak	Dry/Moist	Rib Roast/Chops	Dry
Round, Eye Roast/Steak	Dry/Moist	Loin Roast/Chops	Dry
Round, Rump Roast, Boneless	Dry/Moist	Leg Sirloin	Dry
Round, Bottom Roast/Steak	Dry/Moist	Leg Center Slice	Dry
Round, Tip Roast/Steak	Dry/Moist	Leg Roast	Dry
Cube Steak	Dry/Moist	Ground Lamb	Dry/Moist
Beef for Stew	Moist	Shoulder Roast	Dry
Ground Beef	Dry/Moist		
		VARIETY MEATS	Method
		Brains	Dry/Moist
		Heart	Dry/Moist
		Kidney	Dry/Moist
		Liver	Dry/Moist
		Sweetbreads	Dry/Moist
		Tongue	Dry/Moist

VEAL, similar to lamb cut names

Dry/Moist = Dry or Moist
National Live Stock and Meat Board, 06-202 (1983)

Ground beef, regular = 70 to 73 percent lean, 27 to 30 percent fat. The legal maximum allowable fat in ground beef is 30 percent.

Pork sausage = 50 percent lean, 50 percent fat maximum, but many brand name pork sausages are leaner. The National Pork Producers Council (NPPC) has petitioned to establish a leaner regulatory standard similar to ground beef. At this date that has not been adopted by USDA.

Ground pork has no established standard of composition, but is often similar to ground beef.

Lean ground beef = 77 to 79 percent lean and 21 to 23 percent fat, sometimes called ground chuck.

Extra lean = usually 82 to 85 percent lean and 15 to 18 percent fat, sometimes called ground round/ground sirloin (see Figure 2 for a sample label).

Of the four species of meat, veal will normally be the leanest in each respective cut due to its youth and stage of feeding.

Remembering that any cut of meat can be reduced in fat content by careful trimming and selection of cookery method, muscles in a carcass may be ranked from the leanest to the fattest cuts. (See Table 5.) To keep fat level of cooked meat cuts below 10 percent, marbling should not exceed that of moderate marbling or U.S. Choice quality grade beef (see Figure 3, Unit 1). Most U.S. Choice grade beef has less marbling. U.S. Select grade, comparably trimmed, would be even lower in fat content.

Nutri-Facts

Another tool to help you decide on your meat purchases is the Meat Nutri-Facts program. Available since 1985 in participating stores, it gives nutritive values for 3-ounce portions of individual cuts. (See Figure 3.) This program graphically presents highlights of meat nutrition and shows that many cooked meat cuts of 3-ounce (4-ounce, raw, closely trimmed) serving size are:

1. Nutrient-dense (high in nutrients for the amount of calories supplied)
2. Generally low in calories (around 200 calories)
3. Less fat than many people perceived
4. Lower in saturated fatty acids than many persons thought
5. Moderate in cholesterol contribution
6. Low in sodium, if not cured meat
7. Excellent sources of protein, zinc, niacin and B₁₂ in all meats; iron, in the case of beef and lamb; thiamin (B₁), in the case of pork.

Of course, if cut size is larger than the 4-ounce raw (3-ounce cooked) standard serving size, the nutrient, caloric and cholesterol contents will also be proportionately larger.

Table 5. Meat cut leanness index (selected cuts within a yield and/or quality grade, with similar fat trim)

Leanest:	1. Round/ham/leg—larger whole muscles
	2. Flank steak
	3. Top sirloin, boneless
	4. Other whole muscles with minimal trimmable fat remaining such as chuck mock tender, and boneless brisket
↑ to ↓	
	5. Top loin or ribeye/rib steaks or chops
	6. Chuck/shoulder arm roast/steaks/chops
	7. Chuck/shoulder blade roast/steak/chops
	8. Ground beef, regular
Fattest:	9. Short ribs, side (bacon)

Cut of meat

The number of calories in a 3 oz. cooked trimmed serving is given.

3 oz. is the standard serving size of cooked, trimmed meat used throughout the Meat Nutri-Facts program.

The cut will have a specific method of cooking indicated because the way meat is cooked affects nutritive value.

Measurements for components highlighted by a "•" are based on other standards of comparison, because there are no official U.S. RDA's for these nutrients.

The calorie and sodium standards are based on information from the National Academy of Sciences, Food Nutrition Board which establishes recommended daily dietary allowances.

Fat and cholesterol standards are based on recommendations of the American Heart Association.

Measurements for components highlighted by a "•" are based on the U.S. Recommended Daily Allowances (U.S. RDA). The U.S. RDA was proposed by the Food & Drug Administration. They are guides to the amounts of protein, vitamins and minerals a healthy person needs each day. Source of data is given.

MEAT NUTRI-FACTS

196
calories
PER 3 OUNCE
BROILED, TRIMMED
SERVING

Based on standards of comparison.
2000 calories per day is the midpoint of the recommendation by the National Academy of Sciences for women ages 23-51. National Academy of Sciences also recommend a maximum of 3300mg of sodium per day.

The American Heart Association recommends not more than 30% of calories from fat and no more than 300mg of cholesterol per day.

Based on % U.S. Recommended Daily Allowances.

Data based on USDA Handbook 8-10.

Pork Center Loin Chop

NUTRITION INFORMATION PER COOKED, TRIMMED SERVING		PERCENTAGE OF TOTAL RECOMMENDED DIETARY INTAKE
• CALORIES	196	10%
• FAT •	8.9g	13%
• CHOLESTEROL	83mg	28%
• SODIUM	66mg	2%
• PROTEIN	27g	60%
• IRON	0.8mg	4%
• ZINC	1.9mg	13%
• THIAMIN	.98mg	65%
• NIACIN	4.7mg	24%
• B-12	.63mcg	10%

*Saturated Fat, 3.1g; Monounsaturated Fat, 4.0g; Polyunsaturated Fat, 1.1g

The quantity of nutrients in a 3 oz. serving of meat is indicated by the following measurements:
calories (kcal) = energy measure
gram (g) = 1/28 oz.
milligram (mg) = one thousandth of a gram
microgram (mcg) = one millionth of a gram

The explanation for **TOTAL FAT** provides amounts of saturated, monounsaturated and polyunsaturated fatty acids.

Bars on the graph show the percent of U.S. RDA or other standard of comparison for calories and nutrients. The bars show how much of the standard is available from a 3 oz. cooked, trimmed serving.

Figure 3. Meat Nutri-Facts Graph and Explanation

Trade Organizations, Extension Service, Government, Private Companies

Much information about meat is already available in printed, visual or teaching kit form. A list of many of the organizations with materials on meat is found in the Appendix to this lesson series. For additional information, a list of various meat-related resources and ordering instructions are found in this module's Supplementary Resource Materials section. If you don't know how or where to start, try your local county or state Extension Service offices.

Computer-aided Meat Shopping

Computer software programs exist and are being further developed to assist in making meat purchase decisions. One application being tested is a video-equipped shopping cart that senses your location in the store and provides information on special items in that vicinity. Another interactive computer/printer system allows you to select a certain cut or menu, personalized for your household size. Then it prints out a shopping list of ingredients, a nutritional statement, and some preparation tips. Look for more of these new developments as you expand your meat shopping skills.

Leader Lesson Plan

Objectives

After completion of this unit, consumers will be able to:

1. Demonstrate ability to select a variety of lean meat cuts/products appropriate for their nutritional needs at different life stages or health situations.
2. Fit a week's recommended minimum lean meat servings for all household members into a weekly food budget.
3. Understand fresh meat standardized labeling.
4. Figure price per pound, cost per serving and cost per gram of protein with a nutritional (cost of a nutrient) comparison.
5. Evaluate trade-offs among "cut your own" subprimals, regular bone-in cuts, boneless, closely trimmed retail cuts of common grades and low fat or "natural" alternatives.
6. Determine "best buys" of lean, whole muscle cuts and fresh ground meats for various situations.
7. Find reliable sources of information which address meat selection questions and concerns.
5. Meat departments have product wholesale costs, plus operating overhead costs and hopefully, a small profit to achieve from the meat sold. Meat is priced so each cut is perceived as a value to enough customers to "move" a balanced amount of product.
6. Price-per-pound is most commonly used to buy meat. Bone and fat content, added water in cured meats or loss of moisture and some fat in cooking affect food value received. Cost per standard-sized serving is more useful than price per pound in determining value received. Cost per gram of protein or other high-valued nutrients can give another value comparison.
7. Uniform Retail Meat Identity Standards system (URMIS) of fresh meat labeling has been adopted nationally to anatomically name most fresh meat cuts to assist in purchase selection.
8. Nutri-Facts labeling or other standardized regulations or guidelines can assist in assessing leanness and nutritional content.
9. Government, trade organizations, educational groups and private companies will continue to develop new ways to communicate important information to meat shoppers.

Key Concepts

1. Numerous life situations (social, economic, religious, health and personal preferences) affect the decision to buy and eat meat.
2. Many lean meats can compete favorably with other foods on a cost basis as sources of protein, iron, zinc and the B vitamins thiamin, niacin, B₆ and B₁₂.
3. Edible yield per pound of meat varies from cut to cut. Servings-per-pound charts assist in deciding amounts to purchase.
4. Prices of lean meat cuts vary sufficiently with prices low enough that many consumer budgets can include two 3-ounce cooked servings of meat or meat alternates per person per day.

Advance Preparation Guide

1. Read Unit 2. Shopping for Lean Meat background, lesson plan and handout materials.
2. Complete the activities and interest getter prior to the meeting to better understand the objectives, subject matter and methods of presenting materials.
3. Reproduce copies of the following handouts in sufficient quantities for the group meeting.
 - Meat Shopping Pre-Post Test
 - Check Your Meat Counter Choices
 - Decision-tree for Meat Buying

- Servings of Meat Per Pound
- Meat Buying Aids
- A Buyer's Guide to Cost Per Serving of Meat
- Meat Cutting Yield Test and Price Comparison

4. Ask participants to bring in a meat label.

Presentation Guide

HANDOUT: PRE-POST TEST
Ask participants to complete "Meat Shopping." (See evaluation instrument.)

SAY: This lesson is designed to help you fine-tune your meat shopping skills. We will discuss why people eat meat, buying strategies, budget considerations and cost/value considerations.

A. Life Stage Considerations

Setting the Stage

To get the audience's interest:

ASK: How many of you really feel confident when you enter a store meat department?

How many of you sometimes wonder if meat is good for you?

How many feel there are some changes that ought to be made in the way meat is produced or processed for you?

What are some reasons why you do buy meat?

Notes:

1. Record approximate percentages.
2. Be alert to effect Modules I and II may already have had.

DISCUSS: Why people wish to buy, prepare and eat lean meat. What motivates people to eat meat,

and why they might be interested in particular meats at any one time.

SAY:

We have an almost overwhelming variety of meat from which to choose. Uninformed choices are difficult.

In India and other less developed countries, there might be three or four meat choices in an open air market—mutton or lamb, beef regular cut and limited amounts of steak or chops and chicken. Fat cuts may actually be priced equal to, or higher than lean cuts because calories, and especially fats and oils, are short in supply. In our culture, we face a different problem: a culture of too much convenience-oriented food with a relatively low-cost. Our challenge often is to match our relatively abundant choices with our moderate needs.

B. Budget Considerations and Buying Strategies

SAY:

Consumers purchase meat based on convenience, taste and economic considerations. Lower-cost meats such as variety meats and less-tender cuts will help consumers with limited budgets meet their nutritional needs for meat foods, as will consumption of meat alternates.

Consumers with moderate food budgets have more options, including purchase of quantities when they are on sale and use of a wider variety of meat products.

Those without food-dollar restrictions have the largest array of product options available and may be more likely to utilize more convenient forms of meats as well as more tender cuts.

However, at almost any budget level it is possible to consume adequate levels of meat or alternates to meet nutritional needs.

HANDOUT: Pass out copies of "Check Out Your Meat Counter Choices." Give participants a few minutes to complete it. Discuss which considerations received the most x's. Share ideas for changing purchases.

It is important to remember that people buy meats or meat alternates for various reasons. The choices may not seem consistent, but different considerations will be more important at different times and for different eating occasions.

HANDOUT: You may want to use the "Decision-tree for Meat Purchases" for further discussion of this topic.

HANDOUT: Give each participant a copy of "Servings of Meat Per Pound." (optional)

SAY: Knowing the number of servings to expect per pound of meat can help you decide how much meat to buy for a given meal or dish. Since not all cuts have the same degree of leanness, fat or bone, different numbers of servings are obtained from different cuts. For example, lean cuts and ground meats yield 4 servings-per-pound, whereas spareribs with their large amounts of bone and fat yield only 1 1/2 servings-per-pound.

HANDOUT: "Meat Buying Aids" and "A Buyer's Guide to Cost Per Serving of Meat"

SAY: Retail meat store labels provide worthwhile information to meat shoppers to aid the decision-making process. Most retailers use the Uniform Retail Meat Identity Standards specifications. This standardized labeling system includes:

- a. Species name (beef, pork, etc.)
- b. Primal cut name (leg, loin, shoulder, chuck, etc.)
- c. Retail cut name (tip roast, brisket, etc.)
- d. Form or processing method (optional)
- e. Recommended cooking method (optional)
- f. Freshness date to "Sell by" (optional)

Note the features of the retail cut label on the handout. The meat species—lamb; the primal or wholesale cut—leg; the retail cut name—sirloin chop; the optional feature—recommended method(s) of cookery. You might also note the weight in decimal form, the price per pound, the total amount to pay, the "sell by" date in some stores and the Universal Product Code (UPC) bar codes for checkout scanning.

Ground meats, particularly ground beef, are relatively low in cost and very popular because they can be prepared quickly in so many ways. They are presented in a variety of package materials, package sizes and lean:fat levels. Most common lean:fat ratios are regular, (70:30 percent), lean (78:22 percent), and extra lean (85:15 percent). Price-per-pound and weight of cut are also listed on meat labels.

SAY: Price per pound is the most common way to price meat items. Dividing the price-per-pound by the expected number of servings-per-pound will allow you to compare costs-per-serving of various cuts.

This can be done readily by using "A Buyer's Guide to Cost Per Serving of Meat." (Discuss some examples.)

HANDOUT: "Meat Cutting Yield Test and Price Comparison"

SHOW: Demonstrate cost per amount of lean by weighing a bone-in cut (such as a chop or round steak), trimming bone and external fat, re-weighing and doing the calculations. Penciling out the real costs can be one of the most important tools when buying meat. Discuss findings.

SAY: The Meat Nutri-Facts program is another shopping aid you may find in your store. It was developed by the National Live Stock and Meat Board, the Food Marketing Institute and the American Meat Institute, and launched in 1985. Its purpose is to convey nutritive values of meat cuts in the context of a daily diet. Many stores have carried the Nutri-Facts program for some time. Literature and support materials may be available at many stores if you request them.

The Nutri-Facts program points out that a 3-ounce cooked serving of most meat cuts, if closely trimmed, could fit well into the recommended reduced fat diets of all major health organizations. Two 3-ounce cooked servings per day provide a large portion of many essential nutrients. They are low enough in calories to allow considerable flexibility for selecting other necessary foods from the major food groups to meet the other recommended daily needs.

It is important to realize, however, that many cuts provide more than one 3-ounce serving and size of portion will need to be controlled or additional nutritional value taken into account.

CONCLUDE: We have discussed reasons for eating meat, budget and buying considerations and use of certain buying aids. All of these will give you more tools to use in making better-informed meat decisions.

Handouts

- Meat Shopping
- Check Out Your Meat Counter Choices
- Decision-tree for Meat Buying
- Servings of Meat Per Pound
- Meat Buying Aids
- A Buyer's Guide to Cost Per Serving of Meat
- Meat Cutting Yield Test and Price Comparisons



Meat Shopping

Unit 2, Pre-Post Test

Code/Name _____

Number _____

Circle true or false.

- | | | | |
|-----|---|---|--|
| 1. | T | F | Leaner cuts of meat will always be more expensive than fatter cuts of meat. |
| 2. | T | F | U.S. Choice grade beef has more marbling than U.S. Select. |
| 3. | T | F | Lean ground beef will usually be leaner than most whole muscle cuts. |
| 4. | T | F | Two 3-ounce cooked servings of lean meat per day still are difficult to fit into most health organization recommended diets. |
| 5. | T | F | Choice of stores to shop for meat should hinge first and foremost on advertised meat prices compared to other stores. |
| 6. | T | F | For best economical and nutritive values, a meat shopper should compare foods on a lowest cost per gram protein or other important nutrient basis. |
| 7. | T | F | The recommended serving size for lean meat is a 3-ounce raw portion. |
| 8. | T | F | The most economical way to buy meat is to buy only boneless, closely trimmed cuts with no waste regardless of price per pound. |
| 9. | T | F | Information typically found on meat labels includes calories, price-per-pound of protein, cut weight, price and cut name. |
| 10. | T | F | U.S. Government meat inspection service inspects all retail stores. |

SELECTION

Meat Shopping Key: Unit 2

(Distribute after post-test)

1. F Usually, U.S. Select grade cuts will be the same or lower priced than U.S. Choice cuts. Although fat content may not differ greatly if they are equally closely trimmed of external fat, marbling differences will keep Select cuts slightly leaner.
2. T To be graded U.S. Choice, one degree more marbling is required than for Select, approximately 1.8 percent more fat on raw, lean basis.
3. F Whole muscle cuts at any marbling level, closely trimmed of external and seam fat, will almost always be leaner than lean (78:22 lean to fat ratio) ground meat.
4. F Meat is quite nutrient-dense with high amounts of protein, heme-iron, zinc and several B vitamins for its caloric content, and if closely trimmed is sufficiently low in fat and cholesterol to meet national health organization recommendations.
5. F Advertised meat prices should be only one of several important considerations on where you choose to shop for meat and other food.
6. T Cost per unit of a major nutrient is the most economical way to buy food. A balance of foods is still required to meet all nutrient needs on a daily basis.
7. F A 3-ounce **cooked** portion which comes from a 4- to 5-ounce **raw** portion.
8. F Many times the most economical cuts still contain some bone or fat, because to remove it requires costly labor. Experience with cutting yields, or using your cost per serving table will tell you which is the best buy.
9. F Only cut price, weight and name are typically given on meat labels.
10. F Local and state health officials have the responsibility of inspecting retail stores.



Check Out Your Meat Counter Choices

People purchase meats and other foods for a variety of reasons, including nutritional value, economic value, convenience and taste.

List the meats you ate over the past two days and put one x for each meat item to indicate the most important reason for each particular meat choice.

Day 1	Meat or meat alternate	Nutrition benefit	Cost/Value	Convenience	Taste
_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____
Day 2					
_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____
Total number of x's:		_____	_____	_____	_____

- Are these purchases in line with your nutritional goals? Do they support Dietary Guidelines?
- Are these products in line with your cost/value goals?
- Are they in line with your wants/goals/needs for convenience? Taste?
- How would you change any of these purchases to better meet your goals?

SELECTION

Decision-tree For Meat Buying

1. **Whether to buy?**
 - a. Personal, family and cultural values
 - b. Food enjoyment
 - c. Nutrition concern

2. **When to buy?**
 - a. Upon need
 - b. Short term planning: cook immediately and keep surplus in refrigerator
 - c. Longer term planning: buy fresh to freeze at home, buy already frozen, canned, dried, fermented or cured and smoked to extend storage life. Buy ahead for reasons of:
 - Good prices; either on sale, seasonally, or market going up
 - Convenience or emergencies, having some on hand for future use

3. **Where to buy? Choice of store?**
 - a. Grade(s) of meat offered
 - b. Type of cuts and variations presented
 - c. Sanitation/cleanliness/neatness
 - d. Prices, specials
 - e. Service, good personal interaction with market people
 - f. History of product reliability

4. **How to buy?**
 - a. Price basis
 - b. Nutritive value
 - c. Combination of above, cost per serving or cost per 20g protein
 - d. Taste/expected taste, tenderness, reliability of eating satisfaction

5. **What to buy?**
 - a. Cookery method to be used
 - b. Meat cut label or customer knowledge of identification
 - c. Form of product
 - d. Occasion for use

Servings of Meat Per Pound

Knowing the approximate number of cooked servings to expect from a given piece of meat helps you judge quantities to buy. A serving is about 3 ounces of cooked, lean meat.

SERVINGS-PER-POUND CHART—BEEF

Roasts	Number of Servings*	Pot-Roasts	Number of Servings*
Rib Eye Roast	3	Arm Pot-Roast, Chuck	2
Rib Roast	2	Blade Roast, Chuck	2 1/2
Rump Roast, Round	2	Bottom Round Roast	3
Rump Roast, Boneless, Round	3	Cross Rib Pot-Roast, Chuck	2 1/2
Tip Roast, Round	4	Heel of Round	2
Top Round	3	Shoulder Pot-Roast, Boneless	2 1/2
Eye of Round Roast	4		
Broiling Steaks		Braising Steaks	
Cubed Steak	4	Arm Steak, Chuck	2 1/2
Flank Steak	4	Blade Steak, Chuck	2 1/2
Porterhouse Steak, Loin	2 1/2	Flank Steak	3
Sirloin Steak	3	Round Steak	3
Rib Eye Steak	3	Tip Steak, Round	3
Rib Steak	2		
Rib Steak, Boneless	2 1/2	Other Cuts	
T-Bone, Loin	2	Beef for Stew	4
Tenderloin (Filet Mignon) Steak	3	Brisket	3
Top Loin Steak	2	Ground Beef	4
Top Loin Steak, Boneless	3	Short Ribs	2
Top Round	4	Beef Variety Meats (tongue, heart, brains, sweetbread)	5
		Liver, kidney	4

*Number of cooked servings (3 ounces) per pound from various beef cuts


SERVINGS-PER-POUND CHART—PORK

Roasts	Number of Servings*	Other Cuts	Number of Servings*
Leg (Fresh Ham), Bone-in	3	Back Ribs, Loin	1 1/2
Leg (Fresh Ham), Boneless	4	Bacon (Regular), sliced	6
Smoked Ham, Bone-in	3	Canadian-Style Bacon, Loin	5
Smoked Ham, Boneless	4 to 5	Country-Style Back Ribs	1 1/2
Smoked Ham, Canned	4 to 5	Country-Style Loin Ribs	2
Loin Blade, Bone-in	2	Cubes, Various	4
Top Loin (Rolled), Boneless (Smoked or Fresh)	3 1/2	Hocks (Smoked or Fresh)	1 1/2
Center Loin	3	Pork Sausage	4
Smoked Loin	3	Spareribs	1 1/4
Sirloin	2 1/2	Tenderloin	4
Arm Picnic Shoulder (Bone-in) (Smoked or Fresh)	2	Variety Meats	
Smoked Shoulder Roll	3	Brains	5
Blade Shoulder Boneless (Smoked or Fresh)	3	Heart	5
		Kidney	4
		Liver	4
Chops and Steaks			
Blade Chops or Steaks	2 1/2 to 3 1/2		
Boneless Chops, Loin	4		
Loin Chops	2 1/2		
Rib Chops	2 1/2		
Smoked (Rib or Loin) Chops	2 1/2		
Smoked Ham (Center Slice)	3 1/2		

*Number of cooked servings (3-ounce) per pound from various pork cuts
AMERICA'S CUT *, CHEF'S PRIME * comparable
The Meat Board's Lessons on Meat (1990)

Meat Buying Aids

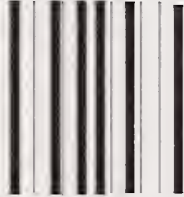
Retail store meat cut label

 000000 000000		MEAT DEPARTMENT	
Weight Pound Net 0.00	PAY \$0.00	Price Per Pound 0.00	

The kind of meat ————— • Lamb Leg • ————— The primal cut
 Cookery method(s), ————— Sirloin Chop • ————— (wholesale)
 optional ————— • Broil, Panbroil, Braise ————— The retail cut
 Freshness date, optional ————— Sell by date

Ground meat labeling follows much the same format with the exception that the lean content is to be listed under the ground meat name.

Retail store ground beef label

 000000 000000		MEAT DEPARTMENT	
Weight Pound Net 0.00	PAY \$0.00	Price Per Pound 0.00	

Ground Beef
 Not Less than 85 percent Lean ————— Lean to Fat
 Ratio (85:15)



A Buyer's Guide to Cost Per Serving of Meat

Table 3. A buyer's guide to cost per serving of meat^a

Servings per pound (3-ounce cooked)	Price per pound, \$											
	1.49	1.99	2.49	2.99	3.49	3.99	4.49	4.99	5.49	5.99	6.49	6.99
1 1/2	.99	1.33	1.66	1.99	2.33	2.66	2.99	3.33	3.66	3.99	4.33	4.66
2	.75	1.00	1.25	1.50	1.75	2.00	2.25	2.50	2.75	3.00	3.25	3.50
2 1/2	.60	.80	1.00	1.20	1.40	1.60	1.80	2.00	2.20	2.40	2.60	2.80
3	.50	.66	.83	1.00	1.16	1.33	1.50	1.66	1.83	2.00	2.16	2.33
3 1/2	.43	.57	.71	.85	1.00	1.14	1.28	1.43	1.57	1.71	1.85	2.00
4	.37	.50	.62	.75	.87	1.00	1.12	1.25	1.37	1.50	1.62	1.75
5	.30	.40	.50	.60	.70	.80	.90	1.00	1.10	1.20	1.30	1.40
6	.25	.33	.42	.50	.58	.67	.75	.83	.92	1.00	1.08	1.17

^aAdapted from Rawls, Walker and Schafer (1983).

Meat Cutting Yield Test and Price Comparisons

Cut _____ Date _____

Description _____

Starting meat cut _____ lbs x _____ \$/lb = \$ _____ Value
(A) (B) (C)

Trim loss (bone, fat, skin, meat juice) _____ lbs or _____ %
(D) (E/A x 100) Equal value price comparison

Lean meat (A-D) _____ lbs or _____ %
(E) (E/A x 100)

Lean meat price/lb = \$ _____ / _____ lbs. lean meat = _____ \$/lb
(C) (E) (F)

Check yourself new _____ \$/lb x _____ lbs lean meat = \$ _____ Value
(F) (E) (C)

What price can I afford to pay for a boneless, closely trimmed lean meat cut to compare with a lower-priced bone-in, less finished cut?

Answer _____ (F) Were you surprised by the differences between prices B and F?

Optional Exercises

1. Serving size and number of servings

Four to 5 ounces (1/4 or 0.25-pound to 1/3 or 0.33-pound) raw, boneless lean meat cooks down to approximately a recommended 3-ounce cooked serving size. Using the 4- to 5-ounce raw weight serving guide, calculate the number of servings this lean meat cut (E) will supply?

Answer: _____ servings.
(G)

2. Servings per pound

Divide the number of servings by the "starting" weight (A) to get average servings per pound.

Answer: _____ servings per pound. Compare this calculated servings per pound with values in Table 1 or Table 2 (Unit 2, pages 9, 10). Do they agree or not? Any reasons evident for differences?

3. Cost per serving

Finally, to derive cost per serving, divide (C) _____ by (G) _____ = \$ _____ /serving. Compare this to similar values found in Table 3 (Unit 2, page 12).

Equipment and Materials

1. Sharp knife, steel/stone
2. Cutting board
3. Small scale to weigh meat cut and parts (5 to 20 lbs)
4. Calculator
5. This handout and a pencil
6. Bone-in meat cut with some trimmable fat, such as beef chuck blade steak/roast, pork shoulder arm picnic roast, lamb leg sirloin chop, beef loin T-bone steak, pork loin country-style ribs
7. Overhead projector, transparency and marker for group demonstrations.

Suggested Learning Experiences

1. Use existing charts, pamphlets, models, etc., produced by cooperating trade organizations, health organizations, universities or government agencies which are accurate and effective concerning the subject and help accomplish efficient learning. The National Live Stock and Meat Board, with representation from all segments of the industry, has a long-standing tradition of especially outstanding resources related to this unit. Other related resources are listed in the supplementary resources.
2. Visit a grocery store and look at the meat case. Use grocery advertisements to figure out a sample menu for a week, including low fat meat choices to fit in budget.

3. Try the cutting yield test at home.

4. Identifying Lean Meat Cuts Activity.
Purchase eight cuts of meat that vary in fat content (include one or two products from each species).

Develop a participant worksheet that includes matching cut names. Cover names on the package of each meat cut with masking tape. Then have participants rank in order by leanness. (Refer to Table 5 in the background information of this unit.)

After all participants have identified the meat cuts and ranked them by leanness, describe the meat cuts in order of leanness.

Supplementary Resource Materials

National Live Stock and Meat Board
444 North Michigan Avenue
Chicago, IL 60611
312-467-5520

- Cut Your Own Beef In-a-Bag, 28-124, undated
- Meat Nutri-Facts Brochure, 50-0004, 1985

U.S. Department of Agriculture
Office of Government and Public Affairs
Washington, DC 20250

- "How to Save Money with Large Cuts of Meat,"
Fact Sheet, AFS-6-4-1, 1981

David E. Schafer
Extension Specialist, Meats
AS&I - Weber Hall
Kansas State University
Manhattan, KS 66506-0201
913-532-6131

- Cost-Value Comparisons-Ground Beef, 1989
- Meat in the Marketplace, 1978
- Motivations Related to Meat, 1990

Evaluation Instrument

Evaluation of the concepts learned by participation in Module III, Unit 2 can be partially accomplished by use of a pre-post test handout. At the beginning of the meeting, ask participants to complete the "Meat Shopping Quiz." Assure them they won't be "graded" and that results will be confidential. Review the completed tests, and statistically summarize the knowledge strengths and weaknesses for special emphasis during the Unit. Keep the tests.

At the last meeting, or by telephone 3 to 6 weeks after the last meeting, repeat the test for all or a representation of the participants. Perhaps volunteers could help with calling. Compare responses to measure individual pre-post knowledge gain. If possible, assess buying skill improvement. Did they feel they saved any money? Did they expect to save money? Have they changed any eating patterns as a result of this lesson? What did they feel helped them the most? Would they do it again? Any other related subjects they'd like to learn about?

Optional Method: If the call-back method is too complicated, have participants keep their pre-test with circled answers through the lesson. At the conclusion, have them re-take the same exam, placing an (X) over any changed answers, and giving a short explanation for the change. If they wish to return the evaluations, code/name them and collect. You now have a quick measure of their knowledge base before and after Unit 2.

Keep the records of your pre-post tests for program evaluation.

References

- Food Marketing Institute. 1989.
The Average Number of Products in Modern Supermarkets. Personal communication.
- National Live Stock and Meat Board. 1983.
The Meat Board Guide to Identifying Meat Cuts. NLSMB 06-202.
- National Live Stock and Meat Board. 1973.
Uniform Retail Meat Identity Standards (URMIS). NLSMB Manual, unnumbered.
- National Live Stock and Meat Board. 1990.
The Meat Board's Lessons on Meat. "Servings Per Pound Charts." NLSMB (Number to be assigned).
- National Live Stock and Meat Board, Food Marketing Institute, and American Meat Institute. 1985. Meat Nutri-Facts, Fresh Meat Nutrition Information Program Manual and NLSMB 50-004 pamphlet.
- Rawls, E. L. ^a, Walker, M. L. ^b, and Schafer, D. E. ^b 1983. A Buyer's Guide to Cost-Per-Serving for Meat. ^a University of Tennessee. Cooperative Extension Service, ^b Kansas State University Cooperative Extension Service. KSU Unnumbered Consumer Card.
- Yankelovich, Skelly and White. 1987. Consumer Climate for Meat—Executive Summary. NLSMB unnumbered.

MODULE IV

Preparation of Today's Lean Meat

Today's consumers, more than ever before, are asking how to properly prepare and select lean meat cuts and products. These questions range from, "What meat cuts are tough and tender?" to "How do I prepare lean meat and provide my family with a fast, low-calorie, low-fat meal?" Consumers are also concerned about a number of food safety issues. They are particularly interested in what they can do in the home to assure the products they prepare and serve are appetizing and safe.

The information needed to answer or address the majority of these questions has been developed. Unfortunately, it is scattered among various industry and affiliated groups and is not easily accessible to consumers. To effectively answer these questions and inform the consumers, it is necessary to identify and assimilate this information into a form which is useful and accessible to consumers and educators. The purposes of this module are to:

- Increase understanding about meat cooking in general, and in particular, low-calorie, convenient cooking methods (Unit 1).
- Identify proper handling and storage methods for all types of fresh and prepared meat products (Unit 2).

Unit 1. Meat Cookery

Contents

	Page
Objectives	3
Concepts	3
Background Information	4
• Science Behind the Sizzle	4
• Methods of Meat Cooking	4
• Medium Tender Cuts of Meat	6
• Methods of Tenderizing	6
• Cooking Light, Cooking Lean	7
• Light Cooking and Preparation	7
• Microwave Cooking	8
• Outdoor Grilling	10
Leader Lesson Plan	11
• Advance Preparation Guide	11
• Presentation Guide	11
Handouts	14
• Evaluation Instrument	
• Science Behind the Sizzle	
• Dry Heat Methods	
• Moist Heat Methods	
• Methods of Meat Cookery	
• Preparation of Medium Tender Meat Cuts	
• Cooking Light, Cooking Lean	
• Changing Recipes	
• Microwave Cooking of Meats	
• Outdoor Grilling	
• Recommended Cooking Temperatures and Degrees of Doneness	
Suggested Learning Experiences	15
Supplementary Resource Materials	16
Evaluation Instrument	17
References	18

Unit 1. Meat Cookery

Objectives

After completion of Unit 1, participants will be able to:

- 1 Explain why we cook meat and what happens to meat during the cooking process.
- 2 Summarize the various methods of dry and moist cookery and identify the various cuts of meat that are appropriate for each.
- 3 Describe the proper ways to prepare “medium” tender cuts of meat.
- 4 Describe how to cook light and lean.
- 5 Explain how to prepare meat using fast, convenient preparation methods.

Concepts

- 1 Knowledge of factors influencing tenderness and palatability can result in more successful and satisfying selections and preparation.
- 2 Matching the particular meat cut with the proper cooking method can yield consistent satisfactory results.
- 3 When properly prepared, meat can fit into a low-calorie, low-fat meal plan.
- 4 Today’s on-the-go, active lifestyle consumers can prepare meat using fast and convenient cooking methods.

Background Information

The Science Behind the Sizzle

Why do we cook meat? Probably most importantly, we as consumers cook meat out of tradition to enhance appearance and flavor. From scientific research we know that cooking will help improve tenderness and contributes to the characteristic flavor of meat. Cooking also destroys any potential bacteria and parasites that could cause food-borne illness.

What happens to meat during cooking? The meat proteins begin to break down, or denature. With cooking, the myofibrillar (muscle) proteins begin to become more rigid, tougher. Proteins lose their ability to hold water and water is lost from the meat product during cooking. Enzyme activity within the meat also increases during cooking; this factor may contribute to increased tenderness in the cooked meat product.

At 85° to 147° F, myofibrillar (muscle) proteins break down and coagulate. At 147° F (medium rare), the proteins begin to harden. As internal temperature increases over 147° F, tenderness may decline.

Cooking also affects the connective tissue proteins. Between 125° to 140° F, the connective tissue (collagen) begins to shrink and toughen. Upon further heating and in the presence of moisture, the collagen turns into a gelatin at temperatures of 148° F and higher. Cooking can cause both tenderizing and toughening. Knowledge on cooking meat properly to ensure a tender, juicy and flavorful product is necessary.

Cooking rates also affect other characteristics of the final product. The faster and hotter the cooking method, the greater the loss of moisture and fat in the product and possibly the greater the toughness. When some medium tender meat cuts are cooked more slowly and with lower temperatures, enzymes in the meat are able to work at their optimum temperatures for a longer period of time in order to break down the muscle fibers and help tenderize the products. In addition, protein hardening (toughening) is diminished and collagen is thoroughly converted to gelatin.

Many of the pleasures of eating meat are experienced in the sensations of flavor and aroma. The characteristic flavor and aroma of

meat develops primarily during cooking. This phenomenon is very complex, sophisticated and not completely understood. Our perception of flavor and aroma is complex because it is based on some several hundred compounds and physiological components. As meat is heated during cooking, the proteins, carbohydrates and lipids in meat are broken down and/or transformed into a variety of different compounds which ultimately contribute to specific flavors and aromas. This process is further complicated when we add marinades and seasoning before, during and after cooking. Few food products known to man are so unique in their flavor and aroma as meat.

Methods of Meat Cooking

There are two primary cooking methods for preparing meat. Dry heat method cookery uses direct or indirect heat without adding moisture during cooking. These methods include roasting, broiling, grilling, pan-frying, stir-frying and pan-broiling. Tender cuts of beef, pork and lamb are well suited for dry heat cooking since these cuts usually contain less connective tissue and can withstand the fast, high heat cooking method.

Some less tender cuts with more connective tissue need a low temperature and long cooking time to turn the connective tissue to gelatin. They require moist heat cooking, which uses indirect heat and the addition of a liquid or retained moisture. Moist heat methods include braising and cooking in liquid.

While there are many meat cuts that obviously fall into the tender and less tender categories, there are a number of beef, pork and lamb cuts that can be classified as "medium tender." With the addition of a marinade tenderizer, mechanically tenderizing the cut and following new recommended preparation methods, many of these medium tender cuts can be prepared by dry heat methods.

Dry Heat Methods

Roasting

1. Season if desired
2. Place meat, fat side up on rack in open pan

PREPARATION

3. Insert meat thermometer
4. Do not add water and do not cover
5. Roast in slow oven at 300° to 325° F—
or lower if desired (250° to 275° F)
6. Suggested cuts:
Beef - rib roast, sirloin tip roast,
tenderloin roast, top round roast,
ground beef loaf
Pork - blade boston shoulder, loin
roast, fresh ham, cured ham,
tenderloin, ground pork loaf
Lamb - leg, boneless shoulder, loin
roasts

Broiling

1. Place thawed meat on rack in broiler
pan 2 to 5 inches from heat source
2. Broil at 400° F until surface is
browned
3. Season if desired
4. Turn meat and cook until desired
doneness
5. Season second side if desired
6. Suggested cuts:
Beef - T-bone, porterhouse steak,
ribeye, strip loin and sirloin steaks,
ground patties
Pork - rib and loin chop, backribs,
spareribs, ground patties
Lamb - loin chop and rib chop,
ground patties

Pan-broiling

1. Place meat in pre-heated frying pan
2. Do not add oil or water
3. Do not cover
4. Cook slowly, medium heat, turning
once
5. Remove fat as it accumulates
6. Season if desired
7. Suggested cuts:
Beef - sirloin, ribeye, T-bone, porter
house steaks and ground patties
Pork - blade, loin and rib chop and
ground patties
Lamb - rib, loin chop and ground
patties

Pan-frying/Stir-frying

1. Preheat pan, then reduce heat
2. Place meat in small amount of
heated oil
3. Do not cover
4. Brown both sides and cook at moder-
ate temperature for pan-frying
5. Turn continuously, cooking at a high
temperature for stir-frying
6. Season as desired

7. Remove and serve immediately
8. Suggested cuts:
Beef - top round steak, sirloin steak
and cube steak
Pork - rib or loin chops and fresh
ham steaks
Lamb - rib or loin chops and leg
slices

Tip How can you tell when the meat cut you are cooking is cooked to your desired degree of doneness? "Facts about Beef, Pork and Lamb," available from the National Live Stock and Meat Board, provides cooking time, temperature and doneness relationships for a large variety of cuts. These are estimates because actual cooking times vary with a number of external factors. Therefore, it is recommended that you cut a small slit in the product (preferably near the bone, if present) and visually check to make sure you have achieved the desired degree of doneness. A thermometer also works well, especially on thicker cuts and roasts. Make sure you insert the thermometer into the thickest portion of the product and away from any bones that may be present in order to get an accurate reading. Refer to the handout "Recommended Cooking Temperatures and Degrees of Doneness" for more details.

Moist Heat Methods

Braising

1. Use a heavy pan
2. Dredge in flour before browning, if
desired
3. Brown both sides of meat in small
amount of oil
4. Pour off excess drippings
5. Season if desired
6. Add small amount of liquid
7. Cover tightly
8. Cook at low temperature (simmer,
185° to 205° F) on
stovetop, or in the oven until tender
9. Suggested cuts:
Beef - arm pot roast, 7-bone roast,
short ribs and round steak
Pork - country-style ribs, shoulder
steaks and chops
Lamb - shoulder chops, neck
slices, riblets and shanks

Cooking In Liquid

1. Coat meat with seasoned flour (optional)
2. Brown both sides of meat in small amount of oil or brown under a broiler
3. Pour off excess drippings
4. Cover with liquid
5. Season as desired
6. Cover and simmer on stovetop or in oven until tender
7. Suggested cuts:

Beef - stew meat, boneless brisket and shank cross cuts

Pork - picnic roast and hocks

Lamb - shoulder meat (stew) and shank

Tip Less tender cuts can be cooked in a pressure cooker to reduce time of ordinary methods. Consult the manufacturer's recommendations for specific cooking times. A slow cooker/crockpot gently simmers meat in a liquid at low temperatures over a long time. This method is quite suitable for less tender cuts of meat. Consult the instruction booklet for specific recommendations.

Medium Tender Cuts of Meat

Cooking medium tender cuts of meat requires special attention if you want a tender and tasty main course. Several medium tender cuts can be prepared like those more tender cuts when you take specific steps before cooking (for example, marinating or mechanically tenderizing), during cooking (slow time and low temperature), and after cooking (cutting the meat across the grain).

Some of the more common medium tender cuts include:

Beef: blade roast/steak, flank steak, eye round steak, bottom round roast and top round steak

Lamb: shoulder chops, breast and riblets

Pork: country-style ribs, shoulder steak and picnic roast

These medium tender cuts can be tenderized and prepared in a variety of methods, including roasting, broiling, pan-broiling or pan-frying/stir-frying.

Methods of Tenderizing

Marinades

Liquids which help tenderize and add flavor to meat are called marinades. They contain salt and some type of an acidic liquid like lemon juice or vinegar, which help break down muscle tissue and possibly connective tissue proteins, as well as add flavor. Most marinades also contain a small amount of oil. Optimum tenderization and flavor are obtained when meat is marinated for 6 to 24 hours under refrigeration before cooking. Most marinades only penetrate the meat 1/4 inch beyond the surface. For maximum tenderizing effect and to decrease marinating time, the marinade can be forked into the cut. Some marinades are used simply to add flavor to meat that is already tender. They may include wine, soy sauce or olive oil and spices.

Pounding

Pounding less tender cuts with a mallet or the edge of a heavy plate tenderizes the meat by breaking down the muscle fibers, as well as muscle connective tissue.

Cubing

As a mechanical commercial process, cubing is similar to pounding; however, it is more thorough. This is usually done by personnel in the meat market/grocery store.

Commercial Tenderizers

Commercial tenderizers contain various enzymes. These natural enzymes help break down muscle tissue and connective tissue. Enzymes, such as papain from the papaya, bromelin from the pineapple and ficin from figs are the most commonly used commercial tenderizers. It is not recommended to allow meat to remain in an enzyme solution for an extended period of time. Excessive tenderization results in a soft, mushy, undesirable product.

- Remember that greater tenderness can be achieved with medium tender cuts when lower temperatures and slower cooking times are used. Temperatures ranging from 200° to 300° fall in the low temperature category

with 250° to 275° F being most commonly used. Temperatures below 200° F are not recommended due to an increased chance of spoilage occurring. This slow cook, low temperature (250° to 275° F) method allows adequate time for those elements that make meat less tender, particularly the connective tissue, to be solubilized to gelatin. The theory is that enzymes within the meat can work longer at this optimum temperature to help tenderize the meat by breaking down muscle fibers. "Long time, low temperature cooking" is one of the most important factors to remember when preparing medium tender cuts.

- Whenever possible, carve or slice meat across the grain. This physically breaks down the muscle structure and enhances tenderness.

Cooking Light, Cooking Lean

Meat is getting leaner. That's a fact. Compared to the mid 1970s, livestock producers are raising animals that are leaner than their previous counterparts. And that is good news for America's consumers. Now that the meat we consume is leaner, you can take steps in preparation and cooking to assure that the meat entree will remain low in calories.

Guide to Healthy Eating

Everyone would like to offer you advice as to how to eat to stay healthy. And it's no wonder there's much confusion as to the relationship between diet and health.

Fortunately, agreement exists among health professionals and nutrition experts on the significance of our diet selections and the role they play in a healthy, active lifestyle.

As seen in Module II "Meat, Nutrition and Your Health," a publication issued by the United States Departments of Agriculture and Health and Human Services called "Nutrition and Your Health: Dietary Guidelines for Americans" offers some guidelines for laying the foundation for a healthful diet.

The guidelines suggest:

- Eat a variety of foods
- Maintain a healthy weight

- Avoid too much fat, saturated fatty acids and cholesterol
- Eat foods with adequate fiber and starch
- Avoid too much sugar
- Avoid too much salt/sodium
- If you drink alcoholic beverages, do so in moderation

With this groundwork in mind, we can move on to preparation and cooking techniques that can limit our caloric, fat and cholesterol intake.

Light Cooking and Preparation

Light cooking and preparation fit well into a healthy, active lifestyle, using fast and easy techniques that can help decrease fat, calories, cholesterol and time in the kitchen. Use these basic suggestions to start the way to a healthful diet:

- Prepare meat meals using basic ingredients. You control what goes into the entree, and this way you avoid hidden calories and too much sodium in ready-made meals.
- Choose lean cuts of meat such as beef top round steak, flank steak and tip roast; pork fresh ham steak, tenderloin or loin chops; lamb leg and loin chops. Refer to "Medium Tender Cuts" handout for more suggestions.
- Trim meat cuts of visible outside fat before cooking. This has been shown to lower the fat content in the cooked product. However, this may lead to a slight decrease in flavor and juiciness.
- Take advantage of the availability of low-fat, low-calorie ingredients that may be added.
- Substitute plain, low-fat yogurt, light sour cream or light mayonnaise for sour cream or mayonnaise, or make "mock sour cream," as listed with recipes. Substitute skim milk for whole milk in sauces.
- Avoid using excess fat or sugar in cooking. Rely on herbs and seasonings to give the meat recipe its flavor.

- When pan-frying, drain and blot the ground meat or meat cut before serving.
- Bake, broil or roast meat on a rack to allow the drippings to fall to the bottom of the pan. This technique can also be implemented by cooking meat on a barbecue grill, hibachi or electric grill.
- Instead of frying meat in oil, use non-stick cookware or small amounts of vegetable sprays. Also, you can stir-fry using small amounts of vegetable oil.
- Pour off drippings after browning ground meats or stew meat.
- Remove the layer of fat that rises to the surface after cooling in stews, chili and soups.
- Combine meat with vegetables for one-dish meals. This reduces kitchen time, extends the value of the meat and helps "stretch" calories.
- Use pasta or rice in combination with meat for quick meals that are delicious and healthful.
- Fat is made up of a variety of fatty acids with the saturated fatty acids being less desirable than mono-unsaturated or polyunsaturated fatty acids.

We can decrease saturated fatty acids in the diet by reading ingredient labels and following these few basic guidelines:

- Avoid using or consuming any foods that contain palm oil, palm kernel oil or coconut oil. These oils are high in saturated fatty acids.
- Avoid commercially fried or deep fried foods unless they are cooked on a non-stick surface or with no fat, or if they are deep fried in corn, safflower, soybean, cottonseed, olive or canola oil.
- The following oils are more desirable as ingredients in processed foods or for use at home (in order of desirability):

canola, safflower, soybean, corn, cottonseed, olive, peanut or mixed vegetable.

Microwave Cooking

With the advent of the microwave oven, and its growing popularity, many meat dishes can be prepared in 20 minutes or less. Because microwaves vary from model to model, check your instruction booklet for actual cooking times and temperatures. As a general rule, most cuts should be microwaved at a low power setting, such as medium or medium-low. Ground meat or reheated products may be cooked on higher power settings.

A wave of new microwave products has hit the market, each with its own specific cooking schedule. Consult the manufacturer's recommendations for best results.

One of the keys to cooking meat in the microwave is the selection of the proper cut, in the appropriate size and shape. As a general rule, boneless cuts in uniform shapes and ground meats can be cooked successfully.

Helpful Microwave Hints

- Roasts should not exceed 2 pounds and have a uniform shape for best results.
- Shape 1 pound of ground meat into four 1/2-inch thick patties. Form a 3/4-inch hole in the center of each, and top with seasoning mix for evenly cooked, well browned burgers.
- Arrange uniform meat, like patties or meatballs, in a circle, leaving a hole in the center of the circle.
- Small portions cook faster than large portions and thin portions cook faster than thick portions.
- Stir dishes with a high liquid content, like soups and stews, to redistribute the heat from the outside to the inside.
- Cover meat with waxed paper or a microwave-safe plastic wrap, to prevent the meat dish from drying out and to prevent splattering.
- Use a rotating device to help facilitate uniform cooking, if possible.

Changing Recipes

Beef Stroganoff

Regular

2 tablespoons flour
1/4 teaspoon salt
1/8 teaspoon pepper
3/4 pound beef sirloin,
cut into thin strips
2 tablespoons shortening
1/2 cup beef broth, condensed
1 tablespoon tomato juice
1 teaspoon Worcestershire sauce
1/4 pound fresh mushrooms, sliced
1 cup dairy sour cream
2 cups noodles, cooked, unsalted

Light

2 tablespoons flour

1/8 teaspoon pepper
3/4 pound beef top round steak,*
boneless, trimmed
1 tablespoon of olive oil (optional)
1/2 cup beef broth, condensed
1 tablespoon tomato juice
1 teaspoon Worcestershire sauce
1/4 pound fresh mushrooms, sliced
1 cup low fat yogurt**
or light sour cream
2 cups noodles, cooked, unsalted

*Slice beef across the grain into 1/8-inch wide strips and 3 inches long. Note: If steak is partially frozen (tempered), it is easier to cut. Wash and slice mushrooms. Cook beef strips and mushrooms in frying pan until brown. Use non-stick frying pan and cooking spray instead of browning in shortening. Add broth, tomato juice and seasonings. Cover and simmer 45 minutes. Mix flour and low fat yogurt** until smooth. Stir into beef mixture. Cook, stirring constantly until thickened. Serve over noodles.

Nutrition Information: 3-ounce serving

Regular

Calories 390
Fat 20g
Cholesterol 145mg
Sodium 631mg

Light

Calories 255
Fat 6g
Cholesterol 83mg
Sodium 371mg

Mock Sour Cream: (1) Put into blender: 2 tablespoons skim milk, 1 tablespoon lemon juice and 1 cup low-fat (1 percent) cottage cheese. Mix on medium-high speed until smooth and creamy, or (2) put yogurt (plain) in a coffee filter, refrigerate overnight to let liquid drip out, leaving a mock-lowfat "sour cream."

More Microwave Hints

Many microwaves do not have the capacity to brown meat. To prepare an attractive meat dish that has a "cooked" browned appearance, you can add a seasoning or browning agent. Several commercial seasoning mixes for microwaved meats are available in the grocery store. They usually contain some type of flour, a starch base and a combination of seasonings. You can also make your own using the following recipe.

Herb Seasoning Mix

Combine 2 tablespoons flour, 1 tablespoon Italian seasoning, 1 tablespoon salt, 1 1/2 tablespoons paprika and 3/4 teaspoon pepper in shaker. Use 1 teaspoon per pound of meat.

Outdoor Grilling

No matter what kind of barbecue grill you own, or what type of meat you plan to cook, these guidelines ensure perfect outdoor cooking.

- Make sure the grill is in a well ventilated area. Stack your fuel in a pyramid shape, and, start the fire 20 to 30 minutes before cooking.
- Meat cuts can be cooked using either direct or indirect heat. Tender cuts like steaks, chops and ground patties are perfect for the faster cooking direct heat method.
- Medium tender cuts, large thick cuts and roasts are better suited for indirect heat.
- Medium tender cuts, large cuts of meat or roasts can be cooked by combining the direct and indirect method. Sear meats (direct heat) on all sides by placing meat on very hot surface for 2 to 5 minutes each side or until browning begins and then finish cooking more slowly (indirect heat), or cook slowly and finish off with direct heat to obtain the external browning desired.
- Watch meat carefully to avoid overcooking or burning while grilling.

*Total cooking time will vary with the cut, temperature of the meat (refrigerator or room temperature), temperature of the coals, outdoor temperature and degree of doneness desired. Frozen or semi-thawed meat will take longer and should be placed further from the heat source to allow time for thorough thawing.

- Use a meat thermometer to accurately determine the doneness of the meat.
- Allow roasts and other large cuts to "set" for 15 minutes before carving.
- Use a marinade to add flavor and tenderize the meat cut. Allow 1/3 cup per pound, marinate overnight for optimum flavor and use any remaining marinade as a sauce for basting during grilling. Marinating especially aids in improving flavor and tenderness.
- Reports exist linking outdoor grilling to a possible increased risk of cancer. Whether or not these risks are of concern to the majority of consumers, the National Cancer Institute has made these following suggestions; you may wish to follow any of these tips during outdoor grilling:
 - Choose leaner cuts of meat and trim meat of outside fat to reduce the fat that drips on the coals.
 - Precook meats containing more fat, like spareribs or ground beef, to remove some of the fat before grilling.
 - Raise the level of the grill so meat is farther away from the coals.
 - Grill meat in aluminum foil until the last few minutes of cooking.
 - Clean grill after every use.

Leader Lesson Guide

Advance Preparation Guide

1. Review Unit 2 carefully.
2. Determine if lesson will be presented in one or two parts; two parts are suggested.
3. Prepare a product demonstration appropriate for the audience from one of the suggested learning experiences.
4. Gather cutting board, carving knife, fork, paper plates and napkins for sampling presentation.
5. Prepare copies of the evaluation instrument and plenty of pencils.
6. Prepare and duplicate educational material, if needed.
7. Obtain additional reference materials from included list, if desired.
8. Decide which additional learning experiences you will use and assemble material described in that section of this unit.

Presentation Guide

This unit can be split into two sections and presented as two 40- to 45-minute lessons. Section A will cover "Science Behind the Sizzle," "Dry Heat Methods" and "Moist Heat Methods." Section B will pick up with "Medium Tender Cuts of Meat," and follow through with "Cooking Light, Cooking Lean," "Microwaving" and "Outdoor Grilling."

For each section, present objectives and introduction in your own words and explain what participants will learn. Use background information as a resource. Stress the importance of matching the meat cut with the proper cooking method to insure a satisfactory end product time after time. A little bit of knowledge on what happens to meat as it is cooked goes a long way in the kitchen.

Section A

Setting the Stage

To get the audience's interest:

Present beef standing rib roasts (or alternate cuts found in Suggested Learning Experiences) cooked by different time and temperature methods. Note differences in cooking loss, drippings and cooked yields. Sample and note differences in flavor, tenderness and overall acceptability. The higher temperature will char the outside of the roast initially. Through the cooking cycle, more moisture will be lost, resulting in a less tender and juicy product. The final cooked product will also yield less because of extensive moisture loss.

Teaching Steps

HANDOUT: "Science Behind the Sizzle"

DISCUSS: Why we cook meat and what happens to meat during cooking. You can be as in-depth or as general as you wish, depending upon your audience. Use the handout as an outline and discuss each section. In your discussion you may wish to relate back to the tenderness, juiciness and flavor differences noted in the different cooking temperatures used in the "interest getter." In addition, you may wish to include an activity such as the one which compares the tenderness, juiciness and flavor of ribeye steaks cooked to four different degrees of doneness.

HANDOUT: "Dry Heat Methods" and "Recommended Cooking Temperatures and Degree of Doneness"

- National Live Stock and Meat Board publications "Facts about Beef, Pork and Lamb" and "Great Grilled Beef" are excellent references and should also be distributed if available.

DISCUSS: Proper methods, times, temperatures and suggested meat cuts for dry heat cookery. Visual displays are very effective if equipment and materials are available. Example: Prepare a roast for roasting, or a steak for broiling, pan-broiling, pan-frying, etc. Another option is to view the section on dry heat cooking in the videos "Cooking Today's Beef," "Updated Meat Cookery" or "Pork Cookery." You may wish to use the video material at the end of this section as an overall review.

HANDOUT: "Moist Heat Methods"

DISCUSS: Proper methods, times, temperatures and suggested meat cuts for moist heat cookery. Again visual displays are effective aids. If you viewed the video segments on dry heat methods previously, then do so for moist heat methods. If not, view material at this point as an overall review. A demonstration on braising would also be effective at this point. Follow example in Suggested Learning Experiences.

HANDOUT: "Methods for Meat Cookery"

DISCUSS: Summarize main points of presentation. Serve products you may have prepared as a demonstration and discuss how well they turned out and differences that occurred due to cooking methods.

Section B

Setting the Stage

To get the audience's interest:

Tenderize a medium tender cut with one of the described methods (background information), cook and compare palatability (tenderness, juiciness and flavor) to the same cut cooked without tenderization. Note: Tenderized cuts should be more tender and flavorful,

depending on which tenderizing method was used. Be sure not to overcook these cuts and to slice across the grain.

An optional interest getter would be to prepare a regular and reduced fat meal and compare the differences in fat and calorie content as well as the similarities in taste.

Teaching Steps

HANDOUT: "Preparation of Medium Tender Meat Cuts"
"Great Grilled Beef" (optional)

DISCUSS: The reasons why some meat cuts are generally less tender than others and their location on the carcass.

Discuss the various methods of tenderizing with an emphasis on the use of marinades. (Use "Great Grilled Beef" as a reference.) Identify various medium tender cuts of meat.

Discuss the differences noted in the "interest getter." Additional activities fit in this section, so be creative!

HANDOUT: "Changing Recipes"
"Cooking Light, Cooking Lean"

DISCUSS: Since meat is leaner today, steps must be taken to avoid unwanted fat and calories that might be incorporated during preparation or cooking.

REVIEW: USDA/HHS "Nutrition and Your Health, Dietary Guidelines." Talk about laying the foundations for a healthful diet and lifestyle.

DISCUSS: Preparation and cooking techniques that limit fat and calories. Also include discussion about desirable and undesirable fats and oils.

You may wish to incorporate a presentation of the regular and modified recipes and samples of both, comparing taste, flavor and calories.

HANDOUT: "Microwave Cooking of Meats,"
"Beef Is a Microwave Favorite"
(National Live Stock and Meat
Board), "Microwave Cooking
Pork" (National Pork Producers
Council)

DISCUSS: Appropriate cuts to be used in
proper settings, product ar-
rangement and browning.
Prepare one or more of the
recipes found in the beef and
pork microwaving pamphlets.
Emphasize ease of preparation
as well as techniques.

HANDOUT: "Outdoor Grilling," "The Official
Guide to Barbecuing" (Barbe-
cue Industry Association),
"Great Grilled Beef"

DISCUSS: Fundamentals of proper and
safe barbecuing. Discuss the
various methods of barbecuing
and which meat cuts fit best in
each method. Emphasize that
barbecuing can be a fun, safe
and convenient method of
cooking that can produce some
fantastic meals if proper tech-
niques and fundamentals are
followed.

SUMMARIZE: Restate objectives. Review the
main points of teaching steps.
As a separate session, you may
want to have a cook-off. Have
students prepare their favorite
meat product. Evaluate them
on methods, quality, palatabil-
ity, nutritional aspects and
maybe even cost-per-serving.
Use your imagination, be
creative!

Handouts

- Evaluation Instrument
- Science Behind the Sizzle
- Dry Heat Methods
- Moist Heat Methods
- Methods of Meat Cookery
- Preparation of Medium Tender Meat Cuts
- Cooking Light, Cooking Lean
- Changing Recipes
- Microwave Cooking of Meats
- Outdoor Grilling
- Recommended Cooking Temperatures and Degrees of Doneness

Evaluation Instrument

Unit 1, Pre-Post Test

Code/Name _____

Number _____

I. Unscramble these medium tender cuts that require additional preparation and added care during cooking.

1. eefb kflna katess
2. krpo unocryt etysl srib
3. blam hsuodlre shocp

II. Circle true or false.

- | | | | |
|----|---|---|--|
| 1. | T | F | Less tender cuts require moist heat methods. |
| 2. | T | F | Roast meat with the fat side down. |
| 3. | T | F | When broiling, place meat 1 to 2 inches from the broiling element. |
| 4. | T | F | Pan-frying/stir-frying requires a small amount of oil. |
| 5. | T | F | Lamb rib chops require moist heat methods. |

III. Matching

- | | |
|---|--------------------------------|
| 1. A combination of a type of acid, oil and seasonings. | 1. Commercial Tenderizers |
| 2. Papain from papaya and bromelin from pineapple are often common ingredients. | 2. Marinade |
| 3. Half inch thick, 1/4 pound, 3/4-inch hole in the middle | 3. Barbecue Meat Cuts |
| 4. Eye round, pork spareribs, riblets | 4. Microwave Ground Meat Patty |

PREPARATION



Evaluation Instrument

Key: Unit 1

- I.
1. Beef flank steaks
 2. Pork country style ribs
 3. Lamb shoulder chops
- II.
1. T
 2. F (fat side up)
 3. F (3 to 4 inches)
 4. T
 5. F (dry heat methods)
- III.
1. 1 - 2
 2. 2 - 1
 3. 3 - 4
 4. 4 - 3

Why do we cook meat?

- Enhance appearance and flavor
- Improve tenderness
- Destroy potential bacteria and parasites

What happens to meat during cooking?

- Meat proteins break down
- Water holding capacity decreases
- Proteins, fats and sugars altered
- Flavor and aroma developed

What happens to meat at different levels of internal temperature?

- 85° to 147° F - Protein denatures and coagulates
- 125° to 140° F - Collagen proteins begin to shrink and toughen
- 147° F and above - Tenderness may decline, OR, if in the presence of moisture, tenderness may increase

How does the rate of cooking affect the product?

- Faster and hotter > greater loss of moisture and fat > increased toughness

Dry Heat Methods

Roasting

1. Season if desired
2. Place meat, fat side up, on rack in open pan
3. Insert meat thermometer
4. Do not add water and do not cover
5. Roast in slow oven at 300° to 325° F – or lower if desired (250° to 275° F)
6. Suggested cuts:
 - Beef** - rib roast, sirloin tip roast, tenderloin roast
 - Pork** - Boston butt, loin roast, fresh ham, cured ham, tenderloin
 - Lamb** - leg, boneless shoulder, loin roasts

Broiling

1. Place meat on rack in broiler pan 2 to 5 inches from heat source
2. Broil at 400° F until surface is browned
3. Season if desired
4. Turn meat and cook until desired doneness
5. Season second side if desired
6. Suggested cuts:
 - Beef** - T-bone, porterhouse steak, ribeye, strip loin, sirloin steaks and ground patties
 - Pork** - rib and loin chop, backribs, spareribs and ground patties
 - Lamb** - loin and rib chop and ground patties

Pan-broiling

1. Place meat in pre-heated frying pan
2. Do not add oil or water
3. Do not cover
4. Cook slowly, medium heat, turn once
5. Season if desired
6. Suggested cuts:
 - Beef** - sirloin, ribeye, T-bone, porterhouse steak and ground patties
 - Pork** - blade, loin and rib chop and ground patties
 - Lamb** - riband loin chop and ground patties

Pan-frying/Stir-frying

1. Preheat pan, then reduce heat
2. Place meat in small amount of heated oil
3. Do not cover
4. Brown both sides and cook at moderate temperature for pan-frying
5. Turn continuously, cooking at a high temperature for stir-frying
6. Season as desired
7. Remove and serve immediately
8. Suggested cuts:
 - Beef** - top round steak, sirloin steak
 - Pork** - rib chops, fresh ham steaks
 - Lamb** - loin chops, leg slices

Moist Heat Methods

Braising

1. Use a heavy pan
2. Brown both sides of meat in small amount of oil
3. Pour off excess drippings
4. Season if desired
5. Add small amount of liquid
6. Cover tightly
7. Cook at low temperature (simmer, 185° to 205° F) on stovetop, or in the oven until tender
8. Suggested cuts:
 - Beef** - arm roast, 7-bone roast, short ribs and round steak
 - Pork** - country-style ribs, shoulder steaks
 - Lamb** - shoulder chops, neck slices, riblets and shanks

Cooking in Liquid

1. Coat meat with seasoned flour (optional)
2. Brown both sides of meat in small amount of oil
3. Pour off excess drippings
4. Cover with liquid
5. Season as desired
6. Cover and simmer on stovetop or oven until tender
7. Suggested cuts:
 - Beef** - stew meat, boneless brisket, shank cross cuts
 - Pork** - picnic roast, hocks
 - Lamb** - shoulder meat (stew), shank

Tip Less tender cuts can be cooked in a pressure cooker to reduce time of ordinary methods. Consult the manufacturer's recommendations for specific cooking times. A slow cooker or crockpot gently simmers meat in a liquid at low temperatures over a long time. This method is quite suitable for less tender cuts of meat. Consult the instruction booklet for specific recommendations.

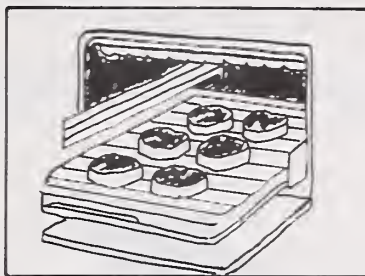
Methods of Meat Cookery

Dry Heat

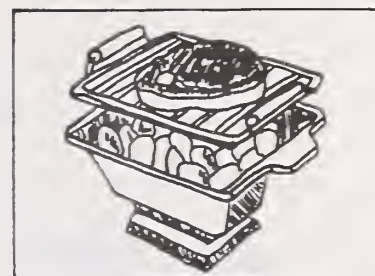
Direct/indirect heat without moisture. Use tender cuts of meat.



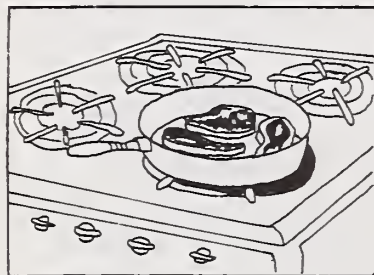
Roasting



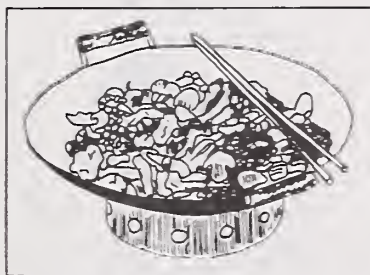
Broiling



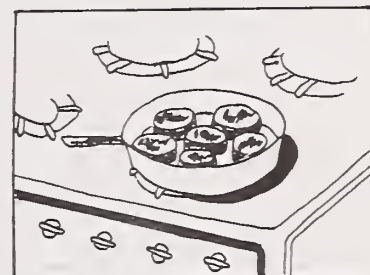
Grilling



Pan-frying



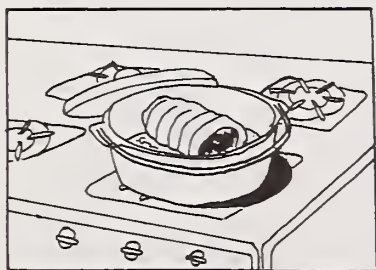
Stir-frying



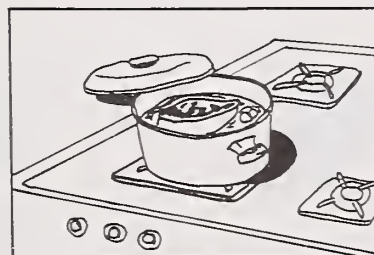
Pan-broiling

Moist Heat

Indirect heat plus liquid or retained moisture. Use less tender cuts of meat.



Braising



Cooking in Liquid

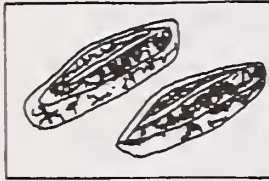
Preparation of Medium Tender Meat Cuts

Tenderization Methods

- Marinades
- Pounding
- Cubing
- Commercial tenderizers

Common Medium Tender Cuts

BEEF



Blade roast/steak



Flank steak



Eye of round steak



Bottom round roast



Top round roast

LAMB



Shoulder chops



Breast



Riblets

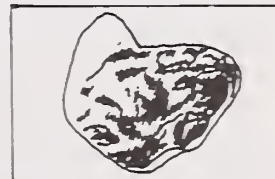
PORK



County style ribs



Shoulder steaks



Picnic roast

Best Methods of Cooking

- Roasting
- Broiling
- Pan-broiling
- Pan-frying
- Stir-frying



Cooking Light, Cooking Lean

Meat Is Leaner

That is good news for American consumers

Guide to Healthy Eating

Follow the guidelines set forth by the United States Departments of Agriculture and Health and Human Services:

- Eat a variety of foods
- Maintain a healthy weight
- Avoid too much fat, saturated fatty acids and cholesterol
- Eat foods with adequate fiber and starch
- Avoid too much sugar
- Avoid too much sodium
- If you drink, do so in moderation

Cooking Light, Cooking Lean

Follow these basic suggestions for a healthful diet:

- Prepare meat meals using basic ingredients
- Choose lean cuts of meat
- Trim meat of visible outside fat
- Substitute low-fat, low-calorie ingredients for ingredients in a meat recipe
- Avoid using added fat or sugar
- Bake, broil or roast meat on a rack
- Instead of frying in oil, use non-stick cookware, or stir-fry in small amounts of oil
- Remove layer of cooked fat from chilled stews, chili or soups

Be smart when using oils

- Avoid consuming or using palm oil, palm kernel or coconut oil
- Avoid commercially fried or deep-fried foods unless cooked on a non-stick surface or without added fat.
- This is the order of desirability of oils used at home or in food products: canola, safflower, soybean, corn, cottonseed, olive, peanut or mixed vegetable.

PREPARATION

Changing Recipes

Beef Stroganoff

Regular

2 tablespoons flour
1/4 teaspoon salt
1/8 teaspoon pepper
3/4 pound beef sirloin
cut into thin strips
2 tablespoons shortening
1/2 cup beef broth, condensed
1 tablespoon tomato juice
1 teaspoon Worcestershire sauce
1/4 pound fresh mushrooms, sliced
1 cup dairy sour cream
2 cups noodles, cooked, unsalted

Light

2 tablespoons flour
- - -
1/8 teaspoon pepper
3/4 pound beef round steak*
boneless, trimmed
- - -**
1/2 cup beef broth, condensed
1 tablespoon tomato juice
1 teaspoon Worcestershire sauce
1/4 pound fresh mushrooms, sliced
1 cup low fat yogurt***
2 cups noodles, cooked, unsalted

*Slice beef across the grain into 1/8-inch wide strips, 3 inches long. (If steak is partially frozen, it is easier to cut.) Wash and slice mushrooms. Cook beef strips and mushrooms in frying pan until brown. **Use non-stick frying pan and a shot of non-stick cooking spray instead of browning in shortening. Add broth, tomato juice and seasonings. Cover and simmer 45 minutes. Mix flour and low fat yogurt *** until smooth. Stir into beef mixture. Cook, stirring constantly until thickened. Serve over noodles.

Nutrition Information: 3-ounce cooked serving

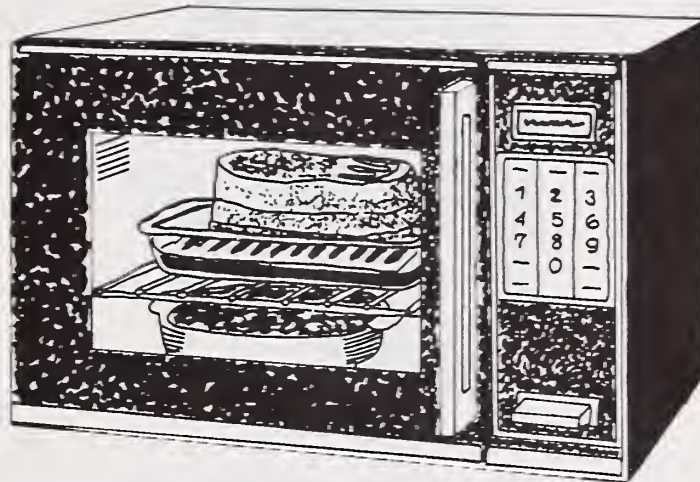
Regular

Calories 390
Fat 20g
Cholesterol 145mg
Sodium 63mg

Light

Calories 255
Fat 6g
Cholesterol 83mg
Sodium 371mg

Mock Sour Cream: (1) Put into blender: 2 tablespoons skim milk, 1 tablespoon lemon juice and 1 cup low-fat (1 percent) cottage cheese. Mix on medium-high speed until smooth and creamy or (2) put plain yogurt in a coffee filter or cheese cloth and allow to drip overnight in the refrigerator. Use the solid as "sour cream."



General Rules for Selecting Meat Cuts

- Boneless cuts in uniform pieces
- Ground meat

Helpful Microwaving Hints

- Roasts: 2 pounds and under
- Ground meat patties: 1/2 inch thick with 3/4 inch hole in center
- Arrange patties or meatballs in a circle
- Small and/or thin pieces cook faster than large and/or thick pieces
- Stir high liquid foods (soups and stews) often
- Prevent meat from drying out by covering with waxed paper or plastic wrap
- Use a seasoning for color and flavor enhancement



Guidelines for Outdoor Grilling

- Place grill in well-ventilated area.
- Use pyramid method to start fire 20 to 30 minutes before cooking.
- Meat cuts can be cooked using either direct or indirect heat. Tender cuts like steaks, chops and ground patties are perfect for the faster cooking direct heat method. Medium tender cuts, large/thick cuts and roasts are better suited for indirect heat.
- Use meat thermometer to determine doneness.
- Allow large cuts to "set" 15 minutes before carving.
- Use a marinade to add flavor and/or tenderize meat cuts.
- Total cooking time varies with the cut, temperature of meat (refrigerator or room temperature), temperature of the coals, outdoor temperature and desired degree of doneness of the meat.
- Reports link outdoor grilling to a possible increased risk of cancer. Whether or not these risks are of concern to the majority of consumers, the National Cancer Institute has made these following suggestions; you may wish to follow any of these tips during outdoor grilling:
 - Choose leaner cuts of meat and trim meat of outside fat to reduce the fat that drips on the coals.
 - Precook meats containing more fat, like spareribs or ground beef, to remove some of the fat before grilling.
 - Raise the level of the grill so meat is farther away from the coals.
 - Grill meat in aluminum foil until the last few minutes of cooking.
 - Clean grill after every use



Recommended Cooking Temperatures and Degrees of Doneness

<u>Meat</u>	<u>Internal Temperature</u>
<u>Fresh Beef</u>	
Rare*	140° F (60° C)
Medium Rare	150° F (66° C)
Medium	160° F (71° C)
Well Done	170° F (77° C)
<u>Fresh Veal</u>	170° F (77° C)
<u>Fresh Lamb</u>	
Medium Rare	140° F (60° C)
Medium	155° F (68° C)
Well Done	160° F (71° C)
<u>Fresh Pork</u>	160° F (71° C)
<u>Cured Pork</u>	
Ham, Raw	165° F (74° C)
Ham, Fully Cooked	140° F (60° C)
Canadian Bacon	160° F (71° C)

*Rare beef is popular, but you should know that cooking it to only 140° F means some food poisoning organisms may survive.

Degrees of Doneness

Rare:	140° F; red in center third, reddish pink to outer surface.
Medium Rare:	150° F; reddish pink in center third, pink to light brown to outer surface.
Medium:	160° F; light pink in center, light brown to outer surface.
Well Done:	170° F; light brown in center, darker brown to outer surface.

Note: Meat products continue to cook after removal from the heating appliance. It is not uncommon to encounter a 2° to 7° F post cooking temperature rise in the product. The extent of this rise is dependent upon cooking conditions, such as rate of heating, length of standing time and leaving the product covered or uncovered.

PREPARATION

Suggested Learning Experiences

1. Prepare and serve a beef bottom round roast using dry heat, moist heat and an intermediate method as described for medium tender cuts. Compare flavor, tenderness and overall desirability. Discuss the differences and why they occur.
2. Prepare microwave herb seasoning mix and microwave quarter-pound beef or pork patties. Use the microwave cooking pamphlets provided with this module as a reference.
3. Tenderize a medium tender cut with one of the described methods, cook and compare palatability to the same cut cooked without tenderization. Use marinades found in "Great Grilled Beef" as a resource.
4. Standardize meat thermometers in a glass of ice water (0° C or 32° F) and see the differences in thermometers from the standard (ice water). Future cooking temperatures can then be adjusted.
5. Cook a bone-in beef rib roast with rapid/high heat (400° F) and low/slow heat (300° F). Remove each at an internal temperature of 140° F and compare cooked yield, amount and appearance of loss (drippings) and tenderness, juiciness and flavor.

Attention: Leader - The roast cooked at the higher temperature will have a greater cooking loss in the form of drippings, the outside will be more charred thus resulting in more shrinkage in the entire product. Tenderness, juiciness and flavor will be affected by the rapid cooking method.

Note: If you desire a leaner cut, you may wish to use a beef sirloin tip, top round roast, pork rib or loin roast instead of the rib roast. These cuts are not only leaner but less expensive. The rib roast was chosen as the example because it shows a much more drastic effect due to higher cooking temperature. However, other cuts can be substituted.

6. Cook similar steaks or chops to rare (steaks only), medium rare, medium and well done degrees of doneness. Sample and compare tenderness, juiciness and flavor. Ribeye, top round and strip loin steaks of beef or rib loin chops of pork and lamb work well for this demonstration.
7. Prepare a typical moist cookery cut (such as a 7-bone pot roast) by braising and broiling/grilling. Compare tenderness and discuss the necessity of moist heat when preparing cuts of meat high in connective tissue. You should see a large difference in tenderness in most of the muscles! Some will be tender even when grilled but the majority require moist heat!

Supplementary Resource Materials

American Lamb Council
200 Clayton Street
Denver, CO 80206

- Classic Grilled Lamb
- American Lamb Cookery Basics

Barbecue Industry Association, The
710 East Ogden Ave.
Naperville, IL

- The Official Guide to Barbecuing

National Live Stock and Meat Board
444 N. Michigan Ave.
Chicago, IL 60611

- Great Grilled Beef
- Cut Your Own Beef In-A-Bag
- Meat Nutri-Facts
- Exciting Recipes With Today's Veal
- The Lighter Side of Beef
- Mealstyles
- Eat Light with Beef II
- Beef, a New Look at an American Classic
- Pork Today, Low-Calorie Pork Recipes
- Cooking Today's Beef (video, 24 minutes)
- Cooking Today's Beef (video)
- Updated Meat Cookery (video)
- Pork Cookery (video)

- Cooking Today's Beef Video Kit
- Facts About Beef
- Facts About Lamb
- Facts About Pork
- Facts About Veal
- Beef Is a Microwave Favorite
- Microwave Cooking with Pork

National Pork Producers Council
P.O. Box 10383
Des Moines, IA 50306

- Light and Lean Pork Recipes
- Microwave Cooking Pork
- How to Light a Fire
- New Classics with Pork

USDA
Food Safety and Inspection Service
Rm. 1165-5 Washington, DC 20250

- The Safe Food Book, Your Kitchen Guide Home and Garden Bulletin 241

Evaluation Instrument

Use the evaluation instrument as a pre- and post-test for participants. See copy in handout samples.

Assessment of the concepts learned in Unit 1 can be accomplished by use of the evaluation instrument. At the first meeting ask participants to complete the evaluation instrument. Keep the results until the completion of the series.

In approximately 6 weeks, ask volunteers on your planning committee to take a representative sample of names on the registration list. Call and ask the participants the questions on the evaluation instrument to see if the concepts taught have been retained. This will provide data concerning what participants have learned about this unit.

References

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Unit 2. Proper Handling and Storage

Contents

	Page
Objectives	20
Concepts	20
Background Information	21
• Transportation	21
• Kitchen Sanitation	22
• Storing Meats	22
• Preparation and Cooking	23
Leader Lesson Plan	25
• Advance Preparation Guide	25
• Presentation Guide	25
Handouts	26
• Evaluation Instrument	
• Home Kitchen Survey	
• Temperature of Food for Control of Bacteria	
• Recommended Storage Times for Fresh and Frozen Meats	
• Wrapping Meat for the Freezer	
Suggested Learning Experiences	27
Supplementary Resource Materials	28
Evaluation Instrument	29
References	30

Unit 2. Proper Handling and Storage

Objectives

After completion of Unit 2, participants will be able to:

- 1 Understand how bacteria and prolonged exposure to oxygen affect fresh and cooked meat quality and shelf-life.
- 2 Describe proper handling and storage methods that are needed to control bacterial growth and slow or prevent meat spoilage.

Concepts

- 1 Meat is a perishable product and it is especially susceptible to bacterial spoilage and contamination.
- 2 Proper handling and storage methods are necessary to assure food safety and satisfaction.

Background Information

If you follow a few common sense guidelines, it's relatively easy to handle and store meat and meat products properly. Especially if you have a basic understanding of how microorganisms and prolonged exposure to oxygen affect meat products. First, let's look at the microbial effect.

Microorganisms are abundant in our world and can be found anywhere you look. You'll need a microscope to see them because they are very small (micro) living things (organisms). Their presence in our everyday life is something we cannot eliminate and must accept; however, we can control the presence of potentially harmful bacteria and can control the growth and proliferation of microorganisms on our food products, especially meats.

Meats, like all animal protein foods, are perishable products. Especially in the fresh state, but also in the cooked state, meat products contain most of the components that all types of microorganisms (bacteria, molds, yeast) need to grow. Bacteria, in particular, need a relatively high moisture content, a good source of protein, vitamins and minerals and a warm environment to grow and increase in numbers.

Some meat products such as beef jerky, summer sausage and pepperoni are low in available moisture and contain other added ingredients that inhibit growth of microorganisms. But this type of product represents a small proportion of all meat products. Most meats are sold in the fresh refrigerated state which naturally provides all of these growth factors for microorganisms with the exception of a warm environment. The only thing not provided is a favorable temperature for growth and this becomes our first line of defense, **Temperature!**

Not all microorganisms are considered to be bad and not all microorganisms react the same to various temperatures. Some strains of bacteria are used under controlled conditions in the production of specialty sausage products such as summer sausage, Genoa salami, pepperoni and others. Unfortunately, most bacteria are harmful; some can cause spoilage of meats while others can also cause varying degrees of illness in humans. The spoilage

organisms can grow at refrigerator temperatures (40° F), but growth is slowed or delayed. Organisms that cause human illness (**pathogens**) grow best at room temperature (60° F to 90° F) and most grow very poorly under refrigerator temperatures. It is these pathogenic organisms, in particular, that we want to control, if not eliminate. Again, **temperature** is our first line of defense. Other methods are also very useful and will be discussed later in the text.

The second concept to understand is the effect that prolonged exposure to oxygen (air) has on the flavor of meat, fat and lean. When meat fats are exposed to oxygen present in air, they are susceptible to a process called **oxidation**. This results in both disagreeable odors and flavors in the cooked product. In this process oxygen actually changes the structure of the fatty acid molecule and forms by-products (aldehydes, ketones and acids) which produce an undesirable flavor and odor in cooked meat. Unsaturated fatty acids are more susceptible than saturated fats to the destructive process. To prevent oxidation, package and store meat properly (as described below).

At various stages of handling and storage of meat, we can control factors that minimize food spoilage, eliminate food-borne illness and maximize the freshness and quality of the cooked meat product.

At each stage, the 4 C's of food handling are important. **Keep it Cold, Keep it Clean, Keep it Covered and Prevent Cross-Contamination!**

Transportation

The grocery store should be the last stop of a day full of errands. This will help keep the temperature changes in meat to a minimum, and discourage rapid growth of harmful microorganisms. If there is a long distance to travel from the grocery store to home, or if the outside temperature is exceptionally hot, a small cooler or ice-chest would maintain a safe temperature for meat and other perishable foods. Under normal circumstances, double-bagging meat in paper bags should assure safe transport home.

Kitchen Sanitation

Wash all dishes, utensils, cutting boards and work areas with hot soapy water after each use. This practice will help reduce the number of microorganisms. In addition, avoid cross-contamination while preparing meats. After working with raw food, scrub the utensils, cutting boards and work areas with hot, soapy water before working with cooked foods. A common mistake is to use the same plate for the cooked meat that was used to take the raw meat to the grill. This is a classic example of cross-contamination. Another good practice is to reserve one cutting board for cutting raw meats, another for fresh vegetables.

After using non-porous cutting boards, meat grinders, slicers and can openers, rinse in mild bleach solution as recommended on the label. Clean the refrigerator often to spot or avoid mold growth or growth of other food-spoiling bacteria. Be sure to check the contents of those forgotten containers toward the back of the refrigerator. Be sure there is good air circulation. Avoid overcrowding the shelves.

Remove all garbage frequently, especially if it contains many food scraps and/or if the temperature is very warm. Avoid accumulation in the garbage disposal. Wash your hands often. Have a clean kitchen and be a clean food handler.

Storing Meats

Cold storage, whether refrigeration or freezing, is the most common and one of the most effective means of preserving meat. Cold temperatures minimize the growth of spoilage and harmful microorganisms.

To store in refrigerator: Store fresh meat in its original container. Do not open and rewrap the product unless absolutely necessary. If you must rewrap it because you can only use half of a package at a time, or because of a torn package, rewrap it with saran wrap or foil and cover it completely. The ideal temperature to store fresh meat is at or slightly below 32° F/0° C. Unfortunately, meat is not the only food product found in the home refrigerator. Most refrigerators range in working temperatures from 36° F/2° C to 40° F/4° C in order to

properly maintain a wide variety of perishable products. Meat can be stored in the coldest part of the refrigerator for 1 to 5 days (refer to "Recommended Storage Times for Fresh and Frozen Meats" handout for exact times for each particular type of retail cut).

Note: The warmer the storage temperature above 32° F/0° C, the shorter the storage time. At no time should meat be stored at temperatures exceeding 40° F/4° C. If meat cannot be stored at proper temperatures in the refrigerator until use, then it should be frozen as quickly as possible.

To store in freezer: (0° F/-18° C or below) The quality of meat can be maintained by freezing. Freezing does not kill bacteria. However, it will drastically slow, if not stop, microbial growth.

To properly freeze meat, overwrap the meat in its original wrapping with moisture-vapor-proof freezer paper. Mark the contents and date it as well. The moisture-vapor-proof wrapping materials lock the moisture in and the air out. These freezer wrapping materials are coated on one side with plastic or wax and are commonly sold in supermarkets. This is very important so that as little oxygen as possible will come in contact with the fat and muscle during storage and minimize oxidation. Another technique is to trim all or most of the external fat from the meat before freezing. A very common mistake that consumers make regarding freezing is to bring meat home from the retail store and freeze it in its original packaging material. Retail cuts of meat are generally sold in a styrofoam tray and overwrapped with an oxygen and moisture permeable material. This is not a desirable material to use for freezing meat. Its sole purpose is to display fresh meat. Freezing meat with this type of packaging or leaving the correct type of freezer wrapping too loose or with rips and tears in it will cause the meat to become "freezer burned." This phenomenon causes severe dehydration of the meat surface and leads to reduced quality and a less satisfying cooked product. Some retail stores sell fresh meat out of their service meat case wrapped in brown or white paper. These are only designed for transportation and short-time fresh storage. They are not plastic or wax coated and therefore not acceptable for freezer storage. If you purchase meat at the retail store that is vacuum packaged then you can

freeze it as is. Vacuum packaging materials are oxygen and moisture-vapor-proof and are excellent for enhanced freezer quality storage. Refer to the "Wrapping Meat for the Freezer" handout for proper instructions.

If you follow recommended practices, start with a high quality meat product and keep your freezer at a temperature of 0°F or lower, the product can be stored frozen for several months (refer to the "Recommended Storage Times for Fresh and Frozen Meats" handout). If the need to refreeze meat arises, freeze as soon as possible. Repeated refreezing can have a negative effect on product quality and product-life, so try to plan your meal needs as accurately as possible.

To store cured meats: Cured meat should be kept wrapped and in the coldest part of the refrigerator (usually the bottom areas, because heat rises). Vacuum packaged meat products will have an extended storage time, but once opened they must be treated like any other product. Freezing of cured meats is usually not desirable but can be done without a large decrease in quality for most products. However, freezing is not recommended for luncheon meats and dry or semi-dry sausages (refer to the "Recommended Storage Times for Fresh and Frozen Meats" handout).

To store canned meats: Canned meats can either be shelf stable or perishable. Store the perishable canned meats, like hams, as the label on the product should indicate, "Keep Refrigerated." The shelf stable canned meats may be stored right along with other canned goods. Avoid buying products in bulging or dented cans. If cans that you have at home show these signs, discard them immediately.

To store leftovers: Cover leftovers to prevent contamination. Do not cool leftovers on the kitchen counter. Place them directly into the refrigerator. If you need to keep cooked meat more than 3 to 4 days, freeze it. Reheat the meat thoroughly (160° F minimum) before serving it again.

Question: How can you tell if a fresh or cooked meat product has been stored too long or improperly and is spoiled?

Answer: The first signs of microbial spoilage are changes in the color and texture of a product when fresh or

immediately after cooking. As spoilage continues, various objectionable odors will develop and sometimes a slime will form on the surface of the meat.

If you are not sure if it is safe to eat, throw it away. Don't take any chances. You may kill the bacteria with cooking but may not destroy the potentially deadly toxins they may have left behind. **PLAY IT SAFE!**

Preparation and Cooking

Preparation:

Wash your hands before handling any food product and between handling of a raw and cooked product. Cross-contamination from a raw to a cooked product is a common mistake that you can easily avoid. Wear gloves to handle foods if you have a cut or infection on your hands. Avoid coughing or sneezing on or near food.

When thawing frozen foods, place the wrapped product in the refrigerator and allow it to thaw completely, or put it in a microwave oven set on a defrost or thaw cycle. NEVER thaw meat products on the kitchen counter! Bacteria can rapidly multiply at room temperature (see handout on bacteria growth and temperature). Allow adequate time for thawing in a refrigerator (overnight is usually adequate except for large roasts and meat packages).

The following table provides more specific time requirements.

Defrosting Time Table

Meat Product	Time in refrigerator (34° to 40° F)
Large Roast	4 to 7 hours per pound
Small Roast	3 to 5 hours per pound
1-inch thick steak or chop	12 to 14 hours

Cooking:

To what temperature should you cook your meat product? The final internal temperature is personal preference; however, cooking end points should never be lower than the temperatures listed in the handout "Recommended

Cooking Temperatures." To make sure you obtain this minimum temperature, use a standardized thermometer and determine the internal temperature in the thickest portion of the product, away from any bones and fat. The time needed to achieve this desired internal temperature depends on a number of factors (oven temperature, size/shape of product, beginning temperature of product, method of cooking, etc.). Monitoring the process with a thermometer is essential. It is better to be slightly over than slightly under the desired temperature.

The following are a few points to remember during cooking:

- Use a thermometer that is accurate. Standardize your home thermometer by placing it in a glass of ice water (32° F or 0° C). Adjust up or down as needed or compensate during cooking if your thermometer is not adjustable. If your thermometer doesn't go down to 32° F, then you may never know exactly to what temperature you are cooking your product. Discard any questionable thermometers you may have and purchase an accurate and reliable oven-proof thermometer.

- Read label for proper times and temperatures, especially for precooked meats such as cured hams.
- If cooking from a frozen state, allow one and one-half times as long to thoroughly the meat.
- Do not partially cook meat one day and finish the next day. If you must cook ahead, be sure to cook completely and refrigerate promptly.
- If you must hold meat before serving, be sure to keep it above 140° F.
- Heat leftovers thoroughly, again to at least 160° F.
- Avoid contact between cooked and uncooked meats.
- **Keep Hot Foods Hot:** (140° F) or above.
- **Keep Cold Foods Cold:** (40° F) or below.

Leader Lesson Plan

Advance Preparation Guide

1. Review packet carefully
2. Obtain and review referenced materials
3. Prepare home/kitchen survey
4. Duplicate evaluation quiz
5. Duplicate educational material if necessary

Presentation Guide

Setting the Stage

Present introduction in your own words and explain what participants will learn. Use the background information as a resource. Stress the importance of proper storage and handling of meats not only from a shelf-life perspective but also from a human health viewpoint.

Teaching Steps

Follow information contained in the background information using the following outline. Utilize handouts where indicated.

HANDOUT: "Temperature of Food for Control of Bacteria"

DISCUSS: Transportation
Kitchen Sanitation

HANDOUT: "Recommended Storage Times and Wrapping Meat"

DISCUSS: Strong Meats
Refrigeration
Freezing
Cured Meats
Leftovers

REVIEW: "Recommended Cooking Temperatures and Degrees of Doneness"

DISCUSS: Preparation and Cooking
Incorporate one or more of the suggested learning experiences into the presentation to emphasize a desired subject area.

SUMMARIZE: Review main points.
Emphasize 4-C's of Storage and Handling.

Handouts

- Evaluation Instrument
- Home Kitchen Survey
- Temperature of Food for Control of Bacteria
- Recommended Storage Times for Fresh and Frozen Meats
- Wrapping Meat for the Freezer



Evaluation Instrument

Unit 2, Pre-Post Test

Fill in the blanks.

1. To freeze meat, keep it in the _____ wrapper and overwrap with _____.
2. Keep _____ foods _____, and _____ foods _____.
3. Avoid _____ - _____ with raw and cooked meats.
4. After using cutting boards, meat grinders and can openers, rinse in a mild _____ solution to destroy bacteria.
5. _____ helps extend the shelf life of fresh meat. It gives a characteristic color of deep purple to the meat.
6. Cool leftovers to _____ degrees Fahrenheit, then _____ immediately.

Circle true or false.

- | | | | |
|----|---|---|---|
| 1. | T | F | Bacteria will not grow at refrigerated temperatures. |
| 2. | T | F | Pork should be cooked to an internal temperature of 107° F. |
| 3. | T | F | Cutting meat and looking at it is the best way to determine doneness. |
| 4. | T | F | Defrost meat on the kitchen counter. |
| 5. | T | F | Do not partially cook meat one day and finish the next. |

PREPARATION



Evaluation Instrument

Key: Unit 2

Fill in the Blank

1. original, freezer paper
2. hot, hot, cold, cold
3. cross-contamination
4. bleach
5. vacuum packaging
6. 40° F, refrigerate

True or False

1. F Refrigerated temperatures will only minimize growth.
2. F Pork should be cooked to an internal temperature of 144° F or higher.
3. F You should use a thermometer.
4. F Defrost meat in the refrigerator or microwave.
5. T

Home Kitchen Survey

Using the following format and key, survey your kitchen or someone else's for general cleanliness and proper handling and storage of meat and meat products. A total of 55 points is possible with the bonus. Refer to the score guide at the bottom of the page to see where your kitchen rates.

Cleanliness in the kitchen	1	2	3	4	5
Cutting boards, wooden or plastic	—	—	—	—	—
Can opener	—	—	—	—	—
Garbage can	—	—	—	—	—
Garbage disposal	—	—	—	—	—
Knives/cutting utensils	—	—	—	—	—
Refrigerator-meat covered/wrapped	—	—	—	—	—
Freezer-meat wrapped properly	—	—	—	—	—
General appearance of kitchen	—	—	—	—	—

Key 1=filthy 2=marginal 3=adequate 4=clean 5=white glove clean

Temperatures*	1	2	3	4	5
Refrigerator	—	—	—	—	—
Freezer	—	—	—	—	—

*An average of five temperatures taken at random areas within the freezer and five within the refrigerator. Leave thermometer in place for at least 1 minute to obtain an accurate reading.

KEY: Refrigerator: 1=44° 2=42° 3=40° 4=36° 5=34°

Freezer: 1=10° 2=5° 3=0° 4=-5° 5=-10°

BONUS: If you have a calibrated meat thermometer
+ 1° - 5 points extra

+ 2° - 3 points extra

If you do not have a meat thermometer—subtract 2 points.

SCORE:

- 45 to 50 + points - Excellent, you pass the white-glove test
- 40 to 45 points - Good, but conditions could be improved
- 35 to 40 points - Fair, please clean up your act
- 34 or below - Don't invite me over for supper. Sorry!

PREPARATION

Temperature of Food For Control of Bacteria

° F

250	Canning temperatures for low-acid vegetables, meat and poultry in pressure canner.
240	Canning temperatures for fruits, tomatoes and pickles in water-bath canner.
212	Cooking temperatures destroy most bacteria. Time required to kill bacteria decreases as temperature is increased.
165	Warming temperatures prevent growth but allow survival of some bacteria.
140	Some bacterial growth may occur. Many bacteria survive.
120	DANGER ZONE. Temperatures in this zone allow rapid growth of bacteria and production of toxins by some bacteria.
60	Some growth of food poisoning bacteria may occur. (Do not store meats, poultry or seafoods for more than a week in the refrigerator.)
40	Cold temperatures permit slow growth of some bacteria that cause spoilage.
32	Freezing temperatures stop growth of bacteria, but may allow bacteria to survive. (Do not store food above 10° F for more than a few weeks.)
0	



Recommended Storage Times for Fresh and Frozen Meats

Eating quality declines after the time shown on this chart.

Keep it
Fresh

Storage Time

Days in the
refrigerator
at 35° to 40° F
(2° to 4° C)

Months in
the freezer
at 0° F
(-18° C) or less

Fresh Meats

Roasts (Beef and Lamb)	3 to 5	6 to 12
Roasts (Pork and Veal)	3 to 5	4 to 8
Steaks (Beef)	3 to 5	6 to 12
Chops (Lamb)	3 to 5	6 to 9
Chops (Pork)	3 to 5	3 to 4
Ground and Stew Meats	1 to 2	2 to 3
Variety Meats	1 to 2	3 to 4

Processed Meats

Bacon	7	1
Frankfurters	7	1/2
Ham (whole)	7	1 to 2
Ham (Half)	5	1 to 2
Ham (Slices)	3	1 to 2
Luncheon Meats	3 to 5*	Freezing not recommended
Sausage (Dry, Semi-Dry)	14 to 21	
Sausage (Smoked)	5 to 7	1
Sausage (Pork)	1 to 2	2 to 3

Cooked Meats

Cooked Meat and Meat Dishes	3 to 4	2 to 3
Gravy and Meat Broth	1 to 2	2 to 3

*After a vacuum-sealed package is opened.
Unopened vacuum-sealed packages can be stored in the
refrigerator for up to 2 weeks.

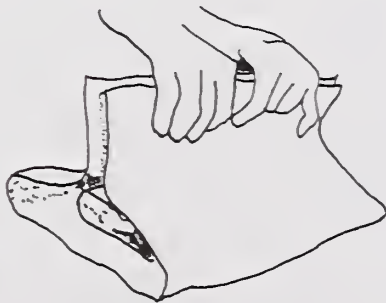
PREPARATION

Wrapping Meat for the Freezer

Choose a moisture/vapor-proof freezer wrap to seal out air and lock in moisture. Pliable wraps like aluminum foil, heavy-duty transparent polyethylene or specially coated freezer paper are good choices to wrap irregular-shaped meat cuts.



1. Place the meat near the center of the wrap.



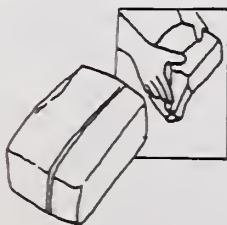
2. Bring the edges of the wrap together over the meat.



3. Fold the wrap over once, then fold again so the second fold is tight against the meat.



4. Make top folds even. Smooth the ends close to the meat and fold to form triangles. Double fold ends toward the package to seal out air.



5. Fold ends under package away from fold-down seam and tape. Label package with name of cut, number of servings and date with a water-proof marker.



Suggested Learning Experiences

1. Survey home/kitchen for proper and improper food handling practices. Use home/kitchen survey as a guide, include additional items if desired. Discuss ways to improve the scores received in the survey and emphasize how this improvement will benefit the individual involved; i.e., increased shelf life of fresh and cooked product, decreased risk of food poisoning, improved general appearance and wholesomeness.
2. Visit a local restaurant or institutional kitchen to observe safe or unsafe handling practices. Make a list of proper food safety practices and look for them on your visit.
3. Call your local Extension home economist or a dietitian at your local hospital. Interview her (or him) on ways to prevent microbial growth in meat and meat products. Ask specifically about proper food handling procedures and her recommendations. Report your findings to the group.
4. Perform a food safety experiment with small portions of meat (ground beef, pork or lamb work well and are relatively inexpensive). Vary temperature, type of product and length of storage. Record the length of time for each product to show signs of spoilage. Note changes in color, odor and texture. Relate your findings to the proper ways to handle and store meat and meat products.
5. Cook a beef, pork or lamb roast. Record the weight of the raw roast on paper. Using a meat thermometer, check the internal temperature as the roast cooks. Every 30 minutes, check the temperature of the roast, noting the time and temperature. Check the recommended temperatures shown for the safety of the meats and note how long it takes to cook the meat to insure safety for the doneness preferred (rare, medium or well done) by your family. Check these times with the estimated cooking times per pound provided in the publications "Facts about Beef, Pork and Lamb." Check the weight of the cooked roast and record the difference in weight. Explain why the cooked weight differs from the raw weight.
7. Practice proper wrapping procedures outlined in handout "Wrapping Meat for the Freezer." Discuss the positive results of proper wrapping technique and the use of the proper freezer wrapping materials. Let everyone practice on a variety of cuts, steaks, roasts and ground products.

Supplementary Resource Materials

USDA
Food Safety and Inspection Service
Rm 1165-5
Washington, DC 20250
(202-447-9351)

- **Cooking Meat and Poultry Products.**
1981. FSIS-6.
- **Food-Borne Bacterial Poisoning.**
1980. FSIS-9.
- **Keeping Meat and Poultry Safe in**
Foul Weather. 1986. FSIS-35.
- **Safe Food To Go.** 1985.
Home and Garden Bulletin #242
- **Salmonella and Food Safety.** 1988.
FSIS-Background.
- **Storing Meat and Poultry Products.**
1981. FSIS-7.
- **The Safe Food Book - Your**
Kitchen Guide Home. 1984.
Home and Garden Bulletin #241

Evaluation Instrument

Use the evaluation instrument as a pre- and post-test for participants. See copy in handout samples.

Assessment of the concepts learned in Unit 2 can be accomplished by use of the evaluation instrument. At the first meeting ask participants to complete the evaluation instrument. Keep the results until the completion of the series.

In approximately 6 weeks, ask volunteers on your planning committee to take a representative sample of names on the registration list. Call and ask the participants the questions on the evaluation instrument to see if the concepts taught have been retained. This will provide data concerning what participants have learned and retained about this unit.

References

American Meat Institute. 1988. Meat Counselor Program - Trainer's Manual. Arlington, VA.

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MODULE V

Meat: A Convenience Bill of Fare

American lifestyles have changed dramatically within the last decade. These changes include the growing number of women working outside the home, the greater number of people living alone and lacking the desire to cook for themselves, the prevalence of less formal lifestyles, convenience for meeting rushed mealtime schedules and increased disposable incomes. These have brought about changes in eating patterns, food choices, methods of preparing food and the manner in which food is consumed.

All these changing meal patterns provide an opportunity for greater use of meat in convenience products, fast foods, single serving foods and the use of such convenience appliances as toaster ovens and microwave ovens. A recent National Live Stock and Meat Board survey confirmed the Food Marketing Institute finding that convenience (speed and meal simplification) has become the major factor in consumer buying decisions. Foods and diet must meet the needs and preferences of today's family situation and lifestyle.

"Eating out" is a growing trend in America. The share of the food dollar spent to eat away from home increased from 26 percent in 1960 to 43 percent in 1985, and is expected to reach 45 percent in 1990. Meat, fish and poultry products comprise one-half of the away from home food product mix. Many restaurants, school and work cafeterias are catering to health-conscious diners by offering healthful substitutes and altering their preparation method when requested. Fast food chains have tripled in the last decade and are moving more into school and home delivery. More than half the meals eaten outside the home come from fast-food restaurants.

The American people have more choices today when eating out, but many do not have enough information to make proper food selection decisions based on their individual needs.

The Module "Meat: A Convenience Bill of Fare," is designed to examine the cost, quality and nutritional factors of convenience meat foods. A convenience food is defined as "any fully or partially prepared food in which significant preparation time, culinary skills or energy inputs have been transferred from the home kitchen to the food processor, distributor or retailer." The purpose of this Module is to provide participants with information about the availability of convenience foods, and factors affecting wise choices in the marketplace.

"Meat: A Convenience Bill of Fare" consists of three units:

- A New Generation of Convenience Entrees and Dinners (Unit 1)
- Shopping a la Carte: Takeout Meats (Unit 2)
- Eating Out: Your Guide to Good Eating (Unit 3)

MODULE V, Units 1 – 3

OBJECTIVES

After completion of this module, consumers will:

- 1 Increase awareness of the many alternatives of processed and prepared meat choices in the marketplace and away-from-home eating places.
- 2 Evaluate and use available convenience meat product information to make informed choices based on individual needs.
- 3 Make informed decisions based on individual needs relative to quality, nutritive value, cost, preparation time and lifestyle situation when purchasing prepared meat products for home consumption or away-from-home eating.
- 4 Reduce food waste and the incidence of food-borne illness from convenience meats through the use of recommended handling, storage and preparation practices.

CONCEPTS

- 1 Convenience meat products offer consumers a wide variety of choices ranging from time-honored canned corned beef hash to gourmet entrees and complete dinners.
- 2 There has been rapid growth in the convenience food industry. Products and services are increasingly offered through supermarkets, convenience stores and neighborhood grocery stores. These include on-site eating places, hot and cold dispensing machines and expanded freezer and deli sections with prepared sandwiches and microwaveable dishes. Education regarding the properties and characteristics of various products would help consumers select convenience foods that best meet their needs.
- 3 Convenience meat products (frozen entrees, prepared dinners, ready to eat processed meats and deli meats) offer many advantages such as reduced preparation time, elimination of some preparation steps, increased variety, portion control, reduced leftovers and decreased waste.
- 4 The use of product information such as nutrition labels, ingredient listing and price per serving can help consumers make informed choices regarding the use of convenience meat products.
- 5 Convenience food products will continue to be an alternative for people when time is more important than money. However, within the context of their food budget, skills that enable consumers to compare costs and nutrient content will help them determine how much of their budget can be spent on these products.
- 6 To prevent food waste and food-borne illness, convenience meat products, like other meat products, should be handled, stored and prepared by following recommended practices. Care and storage instructions and dates on meat product packages are the best guides to follow.
- 7 With the increased consumption of foods away from home, what Americans eat when they eat out is of importance to their overall health and nutritional well-being. Meat is a nutrient-dense food and is important in away-from-home meals. Knowledge of the nutritional value of meat dishes at home or away enables consumers, including those on special diets, to make wise dietary choices.

Target Audiences

Food shoppers in general
Food shoppers at point of purchase
Fast food restaurant patrons
Fast food restaurant owners/managers
Working parents at the work-site
Young families through: Parent-Teacher Organizations
Day Care Organizations
Health Care Organizations
Religious Organizations
Senior Citizen Groups: AARP
Gray Panthers
Religious Organizations
Singles (especially for convenience entrees and dinners unit)
Professionals, through service organizations (Kiwanis, Jaycees, Lions) or professional organizations (Bar Association)
Health club members
Commodity groups
Public school teachers: Home economics
Health
Social studies
Science
Business and industry employee training programs (lunch-and-learn)

Unit 1. A New Generation of Convenience Entrees and Dinners

Contents

	Page
Objectives	5
Concepts	5
Background Information	6
• Frozen	6
• Refrigerated	6
• Safety of Refrigerated Foods	7
• Retort Technology: Performance Under Pressure	7
Leader Lesson Plan	9
• Advance Preparation Guide	9
• Presentation Guide	9
Handouts	11
• A New Generation of Convenience Entrees and Dinners: Evaluation	
• Safe From Store to Table: Pre-Post Test	
• Safe From Store to Table: Fact Form	
• Is It Worth the Difference? Convenient At-Home Meats	
• A New Generation of Convenience Entrees and Dinners: Fact Sheets	
Suggested Learning Experiences	12
Evaluation Instrument	13
References	14

Unit 1. A New Generation of Convenience Entrees and Dinners

Objectives

After completion of this lesson, consumers will be able to:

- 1 List advantages and disadvantages of refrigerated, retort-packaged and frozen meat products.
- 2 Use product information to evaluate refrigerated, retort-packaged and frozen convenience meat products in terms of an adequate diet.
- 3 Follow package instructions and recommended food handling practices to prevent food waste and food-borne illness from refrigerated, retort-packaged and frozen convenience meat foods.
- 4 Analyze refrigerated, retort-packaged and frozen convenience meat purchases to determine if the convenience and other advantages are worth the additional cost.

Concepts

- 1 Convenience meat products offer consumers a wide variety of choices ranging from time-honored canned corned beef hash to gourmet entrees and complete dinners.
- 2 There has been rapid growth in the convenience food industry. Products and services are increasingly offered through supermarkets, convenience stores and neighborhood grocery stores. These include on-site eating places, and expanded freezer and deli sections with prepared sandwiches and microwaveable dishes. Education regarding the properties and characteristics of various products would help consumers select convenience foods that best meet their needs.
- 3 Convenience meat products (frozen entrees, prepared dinners, ready to eat processed meats and deli meats) offer many advantages such as reduced preparation time, elimination of some preparation steps, increased variety, portion control, reduced leftovers and decreased waste.
- 4 The use of product information such as nutrition labels, ingredient listings and prices per serving can help consumers make informed choices regarding the use of convenience meat products.
- 5 Convenience food products will continue to be an alternative for people when time is more important than money. However, within the context of the family food budget, skills that enable consumers to compare costs and nutrient content will help them determine how much of their budget should be spent on these products.
- 6 To prevent food waste and food-borne illness, convenience meat products, like other meat products, should be handled, stored and prepared by following recommended practices. Care and storage instructions and dates on meat product packages are the best guides to follow.

Background Information

Recent changes in American lifestyles have produced a demand for quick and easy foods. Food processors have responded by providing a variety of convenience forms of food.

Frozen

To fill the demand for convenience foods, many new products are appearing in the freezer case. Upscale gourmet frozen dinners and single serving entrees have the advantage of tailoring a meal to one's needs.

A steady diet of highly processed frozen foods may restrict the range of nutrients in your food intake. To ensure healthy eating with frozen entrees or dinners, carefully read nutrition labeling, vary entrees and add foods to make up for nutritional shortcomings.

Frozen dinners and entrees tend to be high in sodium and fat, and low in fiber, calcium and vitamins A and C. Adding low-fat, low-sodium freshly prepared foods high in the nutrients that frozen foods lack can complement and provide for a well-balanced meal. Low-fat dairy foods and fresh fruits and vegetables are good additions.

Most frozen dinners and entrees carry nutrition and ingredient labeling. If you are at risk or concerned about the sodium or fat content, read nutrition labels to compare products. There are many on the market that meet the recommended levels for special low-fat, low-salt diets.

Some convenience products can be costly compared to home-prepared products and may be unsuitable for use by consumers on a tight food budget. Frozen products cost about three to four times as much as similar foods made at home from a recipe. Even when value of preparation time is added to food costs, most of the frozen products are considerably more costly than their home-prepared counterparts. They do offer convenience with the opportunity to shop for specials in quantity and stock up the freezer where space is available.

To get the most for your money, read the label. Look for products with a high proportion of the meat. You'll know it's a high proportion

if it's listed first or second in the ingredient list. If gravy is listed as the first ingredient, then you are paying for more gravy than meat.

The purchase of frozen entrees and dinners will be a trade-off in cost, but they are a tremendous convenience. The growth of frozen foods and microwaves seems to be feeding off each other. One of the top five uses that people make of their microwave ovens is to heat frozen entrees and dinners. Currently there are microwave ovens in 80 percent of American households, and the level is rising. More than 50 percent of all workplaces make microwave ovens accessible. At home, the number of children fixing their own snacks and meals in the microwave continues to grow, as does the number of men using the microwave. All of this creates a huge market for new microwaveable foods, including prepared frozen foods.

Frozen convenience plate dinners and entrees are quick and easy to prepare. Some of the "newer" types reflect a high degree of culinary skill and may, for some consumers, represent a practical alternative to preparing foods from a recipe, particularly if time, equipment and skills are limited.

Refrigerated

Consumers tend to equate freshness with quality, good taste and being better for you. Refrigerated products rank high on the scale of things that are indeed fresh.

Convenient, and also growing in variety, are the increasing numbers of refrigerated foods available at the supermarket. These include barbecue meats, roasts, beef nuggets, butterfly pork chops and entrees. You'll also find combinations of fresh pasta and meat, meat salads, soups and stews.

One real advantage of refrigerated food over frozen is its microwaveability. Microwaves do not penetrate ice very well, so frozen foods take longer than refrigerated to cook, and refrigerated items give a better quality product in the microwave.

Among the increasing variety of refrigerated foods, many are being produced by two techniques, sous-vide (pronounced sue veed)

processing and modified atmosphere packaging. In sous-vide processing, after filling the uncooked or pre-cooked ingredients of a meal or entree into a plastic package, the package is sealed and then vacuum cooked. In the second technique, modified atmosphere packaging, the oxygen is removed from the cooked food package and is replaced by carbon dioxide (to inhibit fungal and bacterial growth) and nitrogen (as an inert filler).

Both produce cooked refrigerated foods. They must be distributed under strictly controlled refrigeration. They can be kept for up to three weeks without freezing or preservatives.

Safety of Refrigerated Foods

The safety of refrigerated convenience foods depends on preventing contamination and controlling the time and temperature in storage. "Time and temperature abuse" can occur in the food distribution chain or by the consumer. A new type of label, called T and T labeling (for time and temperature), can indicate visually the amount of time the food has been exposed above the optimum temperature. If a product has a date stating the length of time it can be held, use the product by the expiration date.

There is a difference between food spoilage and food contamination. Food that is contaminated with harmful bacteria by unsanitary handling may not be "spoiled" food that can be detected by smell, taste or appearance. It is preventable.

Food handlers also must learn safe handling of foods. For example, bacterial growth does not occur during cooking nearly as frequently as during the cooling phase, when a product is left at room temperature.

Partly due to the recent development of sous-vide and modified atmosphere processing, regulations on safety and quality control for these processes are still being developed. If mishandled, foods processed by these methods are subject to food spoilage.

There is another safety consideration of sous-vide and modified atmosphere processing. Removal of oxygen from the plastic pouch could promote the growth of certain disease-causing bacteria, while the packaging itself could mask microbial spoilage.

The consumer can prevent spoilage by carefully handling and storing refrigerated foods. They must be kept refrigerated (below 40° F) or hot (above 140° F) and kept in a clean, sanitized environment. The total time a refrigerated food is held at room temperature should not exceed 2 hours, and this includes serving time during the meal, holding time during clean-up, and cooling down and heating up of leftovers. Even though some of these products may appear to need no refrigeration, it is very important for consumers to read the handling and storage directions on the package, and follow them carefully. Seldom are there visible signs of spoilage.

The most crucial steps for insuring the safety of fresh refrigerated take-out foods include:

- Be sure potentially hazardous foods are from safe and approved sources.
- Check the product for proper temperature, freshness, clear labeling, expiration dates and signs of spoilage (change in appearance, aroma or taste).
- Keep refrigerated items below 40° F until time for use.
- Cool hot perishable foods to 40° F within two hours of cooking, unless held above 140° F.
- Keep hot perishable foods at 140° F or above until served.
- Achieve a temperature of at least 165° F before serving, when reheating already prepared or leftover perishable foods.

The USDA does not recommend that consumers purchase stuffed whole raw poultry. A potential for food-borne illness exists because of the depth of the product, the combination of ingredients and the extra handling. There is also a danger of cross-contamination from salmonella or other microorganisms, if the cutting surfaces are improperly cleaned between foods.

Retort Technology: Performance Under Pressure

Retort technology is the common method used by manufacturers to produce shelf-stable microwaveable entrees and side dishes. The

processing involves a traditional thermal method similar to pressure cooking. The food is placed in a special tray and a vacuum is drawn over it. Then it is sealed, and the whole package goes into a retort pouch, a resin-based enclosure made mainly of laminated foil. The pouch is then pressure-cooked in water to about 250° F. These products will stay fresh, without refrigeration or preservatives, for 18 months or longer.

Among the advantages of retort meats are convenience and portability. The microwaveable meats are a convenience at home, and can even be taken without fear of spoilage to the workplace, where microwave ovens are increasingly available, or on vacation trips where cold storage space is limited.

Shelf-stable entrees have certain advantages over their frozen counterparts because microwaves do not penetrate ice very well. The shelf-stable entrees can be heated more evenly and more quickly.

Retort packaged foods are often reheated in the microwave oven. However, the microwave presents a challenge for quality when the product shifts from one-item products such as burgers or fries to multi-item fare such as dinners. Different foods will cook at different rates, so that in the same container, one food may be underdone while another is overcooked. Different power levels in ovens and variations in cooking times also can lead to inconsistent quality in microwave-cooked foods. Dissatisfaction with multi-item microwave dinners has led many consumers to switch to buying entrees and side dishes that can be cooked separately.

Leader Lesson Plan

Advance Preparation Guide

1. Review the material in the packet and the information in the handout, "A New Generation of Convenience Entrees and Dinners."
2. Collect empty packages of convenience meat foods for display and to use as illustration in your discussion.
3. Obtain sufficient handouts as needed for the audience.
4. Obtain an overhead projector or newsprint pad and markers for group discussion.
5. For a grocery store tour, you will need to prepare as follows:
 - a. Talk to the store manager to get permission for the tour. Explain your purpose. Ask what day and time would be agreeable, and how many people you could "tour" at one time. Small groups of ten or less work best.
 - b. Tour the store by yourself ahead of time. Find examples of each type of convenience meat product you will discuss. Plan for at least one concept of learning from each item, whether it be type of processing, labelling information, cost comparison with home prepared or other types of convenience foods, amount of work saved at home or others.
 - c. Analyze your audience in terms of the time it will take to complete your tour. Be sure to stay within the "time tolerance" of your audience.
 - d. Prepare your audience for what is to come, during the class session prior to the tour or for a brief period immediately prior. Explain your purposes. Tell them exactly what they will do on the tour and what concepts you hope to demonstrate from it.
 - e. Remember you are an ambassador of your organization. Replace every item exactly as you find it. Do not interfere with the store's customers in their shopping chores. Comply with any instructions you receive from the store personnel.

Presentation Guide

- A. A New Generation of Convenience Entrees and Dinners

Setting the Stage

To get the audience's interest:

SAY:

"Imagine that there is a dish of lasagna that's been prepared, placed into a package and placed on the grocery shelf, **not** refrigerated. A month later, a consumer buys the lasagna, takes it home, heats it for a few minutes in the microwave oven, and eats it for dinner. What would you expect to happen?"

After a few responses from the audience (probably related to food-borne illness or perhaps to type of processing or packaging), briefly explain that the product was packaged in retort packaging, and what this means for the shelf-life of the product.

Then present the same scenario, but this time the product is placed in the refrigerator for two weeks. Again ask what the consequences would be for a consumer who ate this product.

Then briefly explain sous-vide (pronounced "sue veed") and modified atmosphere packaging (see leader background information). "So, you can see that new developments in convenience meat processing techniques have resulted in several new choices for consumers."

Teaching Steps

HANDOUT: "A New Generation of convenience Entrees and Dinners: Evaluation." Have participants complete the test.

Explain unit objectives in your own words.

- EXPLAIN:** Types of refrigerated, frozen and retort shelf-stable convenience meat foods. Use actual food packages to show. Arrange them in an attractive display as you finish discussing each one. Briefly describe the main nutritional assets and deficits of each of the foods.
- Divide the audience into small groups. Using label information, have them compare the advantages and disadvantages of the type of convenience meat with other types. Examples include: does not require refrigeration; child could prepare; much higher cost than home prepared; very high sodium content; big time-saver for a complicated recipe that requires only reheating.
- DESCRIBE:** Risk of food-borne illness from refrigerated, frozen and retort shelf-stable convenience meat foods. Include a description of low-temperature pathogens in refrigerated and retort foods. Be sure to explain that food can be contaminated and cause illness, without any detectable change in odor or appearance.
- HANDOUT:** "Safe From Store To Table: Fact Form" Have participants fill this out. Discuss.
- DISCUSS:** The two "C's" of convenience meat foods: Cost versus Convenience. Explain the relationship of cost and pre-preparation. For some consumers, time is more scarce than money. Others have just the opposite situation. Consumers must decide for themselves if the extra cost is worth the time saved. Unfortunately, many consumers are unaware of just how much more they are paying for the convenience.
- HANDOUT:** "Is It Worth the Difference?" Let each member of the group choose one convenience meat food. Using the ingredient list on the package, and standard recipes, have each one complete the worksheet, "Is It Worth The Difference?" Then all members can share their findings with the group. You may wish to collect these and compile them into a table of "Estimated Cost Differences for Selected Convenience Meat Foods."
- HANDOUT:** "A New Generation of Convenience Entrees and Dinners: Fact Sheets"
- SUMMARIZE:** Briefly repeat your main points. It may be helpful to repeat the objectives, briefly describing the information you presented that relates to each one.
- As a follow-up session or as part of an extended session, take the group on a grocery store tour. Include as many types of convenience meats as you can, from the freezer case, refrigerated section and retort. (This activity can also be done after a series of convenience meat lessons, covering information from all pertinent lessons.)

Handouts

- A New Generation of Convenience Entrees and Dinners: Evaluation
- Safe From Store to Table: Pre-Post Test
- Safe From Store to Table: Fact Form
- Is It Worth the Difference? Convenient At-Home Meats
- A New Generation of Convenience Entrees and Dinners: Fact Sheets



A New Generation of Convenience Entrees and Dinners Evaluation Instrument

1. Match the following meat foods in Column A to the type of storage they require in Column B.

Column A

Retort

Frozen

Sous-vide

Modified Atmosphere

Column B

Freezer - 20° F

Refrigerated below 40° F

Freezer - 0° F

Grocery shelf or home cabinet
(room temperature)

2. In the blank beside each advantage and disadvantage listed below, place the letter to represent the type of convenience meat product to which it applies, as follows (more than one may apply to each one):

R = Retort

S = Sous-vide

M = Modified Atmosphere

F = Frozen

Advantages

_____ Quick to prepare

_____ Portion control

Disadvantages

_____ Costs more than homemade

_____ May be high in fat

_____ May be high in sodium

_____ May be low in fiber

3. List three kinds of information found on the convenience meat label that you can use to evaluate the product in terms of time, quality and individual needs. _____

4. What is the best place to get information on proper storage and handling of convenience meat foods? _____

5. The two "C's" of convenience meats which must be evaluated by each individual consumer are C _____ and C _____.

CONVENIENCE



Evaluation Instrument

Key: Unit 1

1. Retort – grocery shelf
Frozen – Freezer at 0° F
Sous-vide **and** modified atmosphere – Refrigerated below 40° F.
2. R, S, M and F will go in all blanks
3. Nutrition label, ingredient list, preparation instructions, serving size, storage instructions, freshness dates, net weight
4. The product label
5. Cost and Convenience

CONVENIENCE

Hydrogenation (continued)
Date: 1/11/71

1/11/71
1/11/71
1/11/71

1. Hydrogenation of 1,2-dichloroethane
to ethane was carried out in a
bomb calorimeter at 100°C and
100 atm. The reaction was
exothermic and the heat of
hydrogenation was found to be
-68.8 kJ/mol.

LEAN MEAT
The Consumer's Choice Safe from Store to Table

Pre-Post Test For Convenience Meats Food Safety

1. What temperature should you keep your refrigerator? _____
2. To assure safety, what is the rule of thumb for the longest time that a perishable food item can be kept **out of** the refrigerator? _____
3. In the food distribution chain from farm to table, where is food-borne illness most likely to be caused, according to national surveys?
_____ Farm
_____ Processing
_____ Retail Grocery Store
_____ Home
4. What temperatures are considered safe for holding food to keep disease-causing microorganisms from growing?:
_____ below 60° F, above 200° F
_____ below 40° F, above 140° F
_____ below 30° F, above 100° F
_____ below 50° F, above 150° F
5. The best place to get food handling and storage information is on the _____.

Circle true or false.

- | | | | |
|-----|---|---|--|
| 6. | T | F | If you purchase a convenience meat product before the "Sell By" date on the label, you know it's safe. |
| 7. | T | F | Retort packaged meats must be kept refrigerated before opening. |
| 8. | T | F | Sous-vide packaged meats have been processed so they can keep on the refrigerator shelf for several days. |
| 9. | T | F | T and T labels can tell you if a meat product has been contaminated with bacteria. |
| 10. | T | F | The U.S. Department of Agriculture recommends that you not buy fresh uncooked stuffed whole poultry, since there is a high possibility for bacteria to grow in it. |

CONVENIENCE

1. Your refrigerator should be kept below 40° F.
2. Food should be left out of the refrigerator no longer than two hours.
3. Most food-borne illness is caused at home.
4. A safe temperature for food storage is below 40° to above 140° F.
5. Food labels give the best information.
6. F A "sell by date" can't tell you about the way it was stored.
7. F They can be held at room temperature.
8. T
9. F They only tell if the product has been held at too high a temperature.
10. T





Safe from Store to Table Fact Form

Mishandling any food could cause food-borne illness. The way to prevent food illness is to keep to a minimum the time the food is held at an improper temperature.

How good are your food-handling habits? Choose a refrigerated or frozen convenience meat food you might use, and complete the chart below to see if you rate high in preventing food-borne illness.

Convenience Meat Food _____

Handling Instructions/Recommendations (from the label) _____

	Recommended Temp.?(Yes/No)	Transport Time
Before you purchase	Unknown	Unknown
In store, in grocery cart	No	
From store to home		
From grocery bag, into proper storage area		
Refrigerator - 40° F; freezer - 0° F)		
Out of refrigerator or freezer, before preparation		
After preparation, before and during meal		
After meal, storing leftovers		
Re-heating and serving leftovers		
TOTAL TIME AT INAPPROPRIATE TEMPERATURES	N/A	

Remember, a good rule of thumb for perishable foods is to hold them at room temperature for no longer than two hours.

Check the temperature of your own refrigerator and freezer.

CONVENIENCE

Is It Worth the Difference? Convenient At-Home Meats

Factor	Convenience product	Home-prepared product	Difference
Preparation Time			
Cost			
Serving Size			
Compare the Differences			

Questions only you can answer:

- For you, is the extra cost worth the time saved? _____
- Would the flavor of the convenience meat product be acceptable to you or your family?

- Is the portion size enough for you? _____ Would you need to buy more, or supplement with other foods prepared at home? _____
- What effect would this have on cost and preparation time? _____

- Is there someone in your family who is watching calories, sodium or fat in his/her diet? If so, can you control these factors in away-from-home foods? _____



CONVENIENCE

A New Generation Of Convenience Entrees and Dinners: Fact Sheets

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Introduction

Convenience foods have become a staple of the American diet. Technological developments in processing, packaging and cooking food, including the microwave, have opened the door to numerous new products. Together these have resulted in the production of a new generation of convenience foods: refrigerated, both cooked and fresh; retort or aseptically packaged shelf-stable; and frozen. They include a wide array of packaging styles, processing techniques and preparation requirements. Some are made by food manufacturers or specialty food vendors, while others are partially or fully assembled in supermarket kitchens or meat-preparation areas. There are many different forms to fit the consumer's preference for convenience, taste and healthfulness.

Factors to Consider When Buying Convenience Foods

Quality, nutritional value, cost, personal preference and time saved are among the many factors to consider when choosing convenience meat products. These are other factors that may influence your decision:

- Some of the "newer" types reflect a high degree of culinary skill and for some consumers, may represent a practical alternative to preparing foods from a recipe, particularly if time, equipment or skills are limited.
- Ready-to-eat or heat-and-eat meat products offer a variety of nutritious choices when children are doing their own cooking.
- Where time and energy are a factor, convenience foods offer busy workers the option to take food to the workplace, especially where microwave ovens are increasingly available. If your only alternative is to skip breakfast, a

reheated frozen biscuit and meat combo with fruit juice or milk can be a wise choice. For workday lunches, convenience foods can save the hassles of parking and traffic at lunch hour.

- Some convenience products can be costly compared to home-prepared products and may not be suitable for use by consumers on a tight food budget.
- Assessing the nutritional adequacy of plate dinners and entrees is no easy task for consumers. However, it can be done with the help of nutrition labels.

Convenience Foods Categories and What They Have to Offer

A combination of flash cooking, fast packaging, flash freezing and quick delivery to the supermarket has produced new options for consumers.

Frozen

Today's frozen entrees and dinners bear little resemblance to the traditional TV meatloaf dinners, frozen pizza and pot pies of the 1960s. As lifestyles have become more upscale, so have the frozen dinners and entrees. (It's no wonder that they have become the mainstay of many Americans' diets.) There are hundreds to choose from and new varieties are introduced on the market each month.

Today's choices in the meat category include dishes such as Beef Bourguignonne, Beef and Pork Cannelloni in Mornay Sauce, and Beef Pepper Steak. The dinners are usually accompanied by side dishes of pasta, rice, baby carrots, broccoli florets or oriental vegetables. They come packaged in family size, single serving size or servings for two.

Next to "carry-out" foods, which are ready-to-eat, frozen plate dinners and entrees probably represent the ultimate in convenience. From the standpoint of preparation time, it is hard to compete with such products. Instead of taking 35 minutes to heat in the oven, today's frozen meals can go from the freezer, into the microwave oven, then directly to the table in the same container, all in approximately ten minutes.

Most importantly, with a little simple planning and careful selection, these upscale versions can be tailored to your taste and a healthful, nutritious diet. The nutrition information panel on the package lists the percentage of U.S. Recommended Daily Allowance for eight important nutrients. When carefully examined you will note that they vary widely in vitamins and minerals.

These modern-day frozen entrees and dinners are generally low in fiber, calcium and vitamins A and C. But these meals can be made nutritionally balanced with the addition of other "convenience" (time-saving) foods. A tossed salad and fresh citrus added to any dinner provide fiber and vitamin C. A single serving of a whole-grain bread (without butter or margarine) will add more fiber with little fat, as well as B vitamins and trace minerals like zinc and magnesium. To round out the meal, a low-fat dairy product such as skim milk will provide the calcium and vitamin A.

Check the food label to find what ingredients are in the product. On most foods the ingredients must be listed. Because ingredients have to be listed in order of weight, from the most to the least, it is easy to see exactly what you are buying. If gravy is listed as the first ingredient, then you are paying for more gravy than meat.

Since the portion size of most dinners is small and/or controlled to keep calories low, people who have larger appetites may leave the table hungry. To compensate and prevent overindulging in snacking, a larger salad or fresh fruit for dessert could be served. And remember, salad doesn't have to be made from scratch each day. An assortment of freshly prepared vegetables or fruits can be kept in a covered container and stored in the refrigerator for several days.

For those concerned about weight control, heart disease and hypertension, the three most important pieces of information on the nutrition label are fat, sodium and calories. The

total calories in the frozen dinner should fit within your energy needs. People on sodium-restricted diets should check sodium levels carefully. Many frozen dinners have more than 1,000mg of sodium. The general recommendation for fat intake for healthy people is to keep the daily total below 30 percent of calories. If you have a special health problem, you may need to restrict fat, sodium or calories even more.

Economically speaking, frozen entrees and dinners cost three to four times more than similar foods made at home from a recipe. Even when value of preparation time is added to food costs, most of the frozen products are considerably more costly than their home-prepared counterparts. When good buys are available, they can be stored safely in the freezer for added convenience and economy.

Microwaveable "fast foods," such as frozen breakfast sandwiches, hamburgers and french fries, are other convenience food products. In some cases these are not priced competitively with their restaurant counterparts. For example, a cheeseburger and french fries would cost approximately \$1.63 in a fast food restaurant, \$1.72 from the freezer section and \$.60 to make at home. However, they offer the convenience of home freezer storage for a fast meal without a trip to the neighborhood drive-through restaurant. The following table presents a nutrinoomic (nutrition for money spent) comparison of selected frozen entrees and dinners. Note that entrees vary in total weight and in the amount of meat present.

Refrigerated

The refrigerator case is growing. The new generation of refrigerated meat products offers convenience and "closer to fresh" product characteristics. These products will be typically found in the deli or refrigerated meat section of food stores. Some of the selections you have to choose from include:

- Cooked foods, delivered to the grocery store frozen, are thawed and sold from the refrigerated case. There are complete dinners, individually packaged entrees, vegetables, side dishes and desserts.
- Prepared ready-to-cook fresh meat combinations, carried in the meat department for your convenience. Strips of beef, pork and lamb complement various vegetable combinations for shish-kabob or stir-fry.

Nutrinomics of selected frozen entrees and dinners
For 100g Portions (Approximately 3.5-Ounce)

Entree and Dinner	Current price	1988 price*	Calories (kcal)	Protein (g)	Carbohydrate (g)	Fat (g)	Cholesterol (mg)	Iron (mg)	Sodium (mg)
Brand # 1									
Beef Pepper Steak	_____	\$3.49	94	7.3	9.4	3.1	19.2	0.9	315
Chicken Burgundy	_____	2.59	72	7.5	7.8	1.2	23.3	0.2	287
Chicken Oriental	_____	3.09	84	8.7	9.1	1.4	26.2	0.3	255
Seafood Natural Herbs	_____	3.79	73	3.6	10.9	1.5	7.6	0.3	438
Brand # 2									
Oriental Beef	_____								
w/Vegetables & Rice	_____	2.59	110	8.1	12.2	3.3	14.2	4.1	467
Turkey Dijon	_____	2.29	103	9.2	7.4	4.1	25.8	2.2	380
Salisbury Steak with Italian Style Sauce and Vegetables	_____	2.29	100	9.2	5.2	4.8	35.0	5.5	258
Brand # 3									
Chicken Cacciatore	_____	2.89	91	8.4	7.7	2.8	29.9	3.5	220
Glazed Chicken Breast	_____	2.89	84	9.8	6.6	1.7	24.6	5.2	260
3-Cheese Stuffed Shells	_____	2.89	98	5.3	12.9	2.8	7.0	5.2	260
Turkey Divan	_____	2.89	98	7.3	9.1	3.1	14.1	5.2	290

Note: All nutritional composition data were converted into values per 100g by using the following equivalents: 1 ounce = 28g; 100g = 3.5 ounce. The figures are for 100g portions which would not reflect the total amount of nutrients in the suggested portion for each brand. Read the nutrition information on each product to find the amount of nutrients for the entire portion which is greater than 100g.

Source: Committee on Technological Options to Improve the Nutritional Attributes of Animal Products, Board on Agriculture, National Research Council. Designing Foods: Animal Product Options in the Marketplace. Washington, DC: National Academy Press, 1988.

*Prices are based on Gainesville, FL market, 1988, and may vary in your area. To update price, use column on "Current Price."

Fresh uncooked stuffed meat products, veal or pork chops with pockets are also available.

- Pre-cooked, microwave-ready meats, like barbecue meats, roasts and re-structured products such as breaded veal patties, are becoming popular in the meat case.

These partially processed foods share the characteristics common to all refrigerated foods:

- Sensitivity to temperature and consumer abuse
- Limited shelf-life
- Potential for consumers to mishandle them, especially if they appear to be shelf-stable
- Optimum storage at 33° to 40° F

All refrigerated products are perishable. The safety of these foods depends on preventing contamination and controlling the time and temperature in storage. Food handlers need to realize the difference between food spoilage and food contamination. Food that is contaminated with harmful bacteria may not be "spoiled" food that can be detected by smell, taste or appearance. To prevent time and temperature abuse most products are labeled with a date and storage instructions.

The U.S. Department of Agriculture (USDA) regulates all poultry and meat products. The Food Safety and Inspection Service (FSIS) of USDA does not recommend the purchase of stuffed refrigerated whole raw poultry products. There is a potential risk for food-borne illness because of the depth of stuffing, type of combined ingredients and extra handling.

Sous-vide processing and modified atmosphere packaging allow for an increasing number of cooked ready-to-eat refrigerated meat products. Translated, sous-vide means "under vacuum." It is a vacuum technique that removes air from around the product that has been placed in a special plastic pouch. In sous-vide processing, the products are pasteurized, and then must be distributed under strictly controlled refrigeration.

"Modified atmosphere" foods are packaged with other gases (usually carbon dioxide or nitrogen) replacing part of the oxygen. These meat products are fresh and have never been

frozen. Processed foods using these techniques include soups and sauces, entrees, full meals and uncured meat and poultry items.

Partly due to the recent development of sous-vide and modified atmosphere packaging, there are few regulations on safety and quality control for these processes. Foods packaged by these methods may be subject to food spoilage by low-temperature pathogens. However, manufacturers are working to refine delivery and code dating systems.

Retort Foods: On the Grocery Shelf

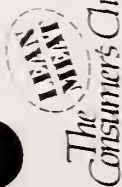
Retort meat products will stay fresh without refrigeration or preservatives. Products packaged this way are safe for two to five years under normal storage and handling conditions. During processing the food is placed in a retort container that is closed, and the container and food are brought to a very high temperature to sterilize the food and make it shelf-stable. Some meat products available are spaghetti with meat sauce, chili con carne, beef ribs with barbecue sauce, lasagna and beef roast.

Packaged pre-cooked meat products, called "convenience meat," offer several benefits. They can be heated in the microwave in the container in which they were bought. They can be transported without refrigeration and prepared quickly, since they do not require preparation or thawing time. They can be microwaved more evenly than frozen foods, since microwave energy does not penetrate ice very well.

Ingredients used in retort foods must be at their peak of quality to withstand the high temperature required in retort processing. The eating quality of retort packaged foods will be similar to that of canned foods, and may be slightly better.

Convenience at What Price?

When you buy upscale convenience meat products, most will cost much less than eating out, but will cost more than the home-made version. Some, however, cost less in the convenience forms, especially for small households that can't take advantage of quantity "family pack" bargains. The wise shopper will make a cost comparison to figure which type of meat food costs less. In evaluating costs of convenience meat foods, for example, consider the



Nutrinomics of Selected Retort Dinners

Dinner and first three ingredients*	Serving size (ounce)	Current price	1988 Price*	Calories (kcal)	Protein (g)	Carbohydrate(g)	Fat (g)	Iron %	
								US RDA	Sodium (mg)
Tender Beef Roast - Beef, potatoes, beef stock	10	—	2.69	260	29	19	8	15	950
Boneless Beef Ribs - Cooked beef ribs, tomatoes, potatoes	10.5	—	2.69	450	31	32	22	20	800
Beef Stroganoff - Beef, concentrated beef broth, cooked egg noodles	10	—	2.69	280	24	26	9	10	1,620
Chicken Acapulco - Chicken breast, rice, sour cream	10.6	—	2.69	440	27	47	16	6	1,500
Lasagna - Tomatoes, ricotta cheese, cooked lasagna noodles	10	—	1.99	350	24	28	16	10	1,200
Sukiyaki - Beef, cooked rice, concentrated beef broth	10.3	—	2.69	320	25	37	8	10	1,420
Lemon Fillet of Cod - Fillet of cod, rice, half and half	10	—	2.69	400	25	33	19	5	1,250
Spaghetti with Meat Sauce - Tomatoes, cooked spaghetti, beef	10	—	1.69	220	13	36	3	15	980

Ingredients shown are first three ingredients appearing in ingredients list on the package.

Note: All nutritional data were taken from nutrition labeling on packages of the items listed.

*Prices are based on Gainesville, FL market, 1988, and may vary in your area. Note: to update prices, use "Current Price" column.

CONVENIENCE

cost of a stuffed pork chop made from a recipe at home at \$1.15, the frozen version at \$1.05 and from the deli take-out at \$1.55.

Serving for serving, retort foods cost more than home prepared or refrigerated foods of the same type. For example, a 10-ounce serving of lasagna costs \$1.99 for the retort product, \$1.79 for a single serve refrigerated, \$1.05 for family pack refrigerated, and \$.73 made at home from a recipe. Sliced beef roast with potatoes and vegetables costs \$2.49 retort and only \$1.23 made at home.

The quantity and type of ingredients used in the products are helpful in judging quality and selecting alternative forms that best meet the nutritional needs for the money spent. Ingredients are listed on the container. The first ingredient tells you how most of your money is spent. If pasta, potatoes or sauces are listed first, you're probably short on meat. The difference in some products is reflected in different basic ingredients. For example, a less expensive product could be made from chopped and formed restructured steaks, rather than a whole roast.

When evaluating the product, consider if there is no waste from deboning or trimming. What you buy is what you eat.

Convenience foods can reduce the need for costly, rarely used, hard-to-find and often perishable ingredients used in specific recipes, all of which can add up to extra money and storage space.

A major factor in convenience food is packaging. Packaging helps to determine the shelf life, portability, serving size and cooking techniques. It also has an effect on cost. As packaging gets more sophisticated, it tends to get more costly. Foods packed in single serving size containers take more packaging and labor per unit weight than larger units, thus increasing cost. Meat products in microwaveable packaging tend to be more expensive than products in traditional packaging. Some frozen dinners come on their own microwave-safe plastic plates, which can quickly stack up in your cabinet.

Safety Considerations

To avoid food-borne illness from convenience meat products, follow label instructions for handling and storage. Many products have

"sell by" and "use by" dates on the label, and these will be helpful. A good rule of thumb for perishable foods is to hold them at room temperature for no longer than two hours. Keep them hot, above 140° F; or cold, below 40° F.

With all the technology available to process, store and monitor foods, it is up to you to prevent food-borne illness. Use care in selecting meat products, get them from store to home rapidly, and store them at the proper temperature. Follow label directions, and if there are none, choose another product. Over half of food-borne illness is caused at home. Be sure it's not **your** home.

Convenience Foods in the Day's Diet: Get a Good Fit

A steady diet of highly processed convenience foods may restrict the range of nutrients in your food intake. To ensure healthy eating with precooked or ready-to-cook entrees or dinners, carefully read nutrition labels, vary entrees, and add foods to make up for nutritional shortcomings.

No one food or meal supplies all nutrients in the amounts needed. Eating a variety of foods will help assure that all nutrients are provided. Daily, a variety of foods should be included from the following major groups: fruits; vegetables; cereals and other foods made from grains, such as breads; milk and dairy products, such as cheese and yogurt; and meat, poultry, fish, eggs, and dry beans and peas.

Remember, the nutritional contribution of some convenience foods may be less than ideal. Be alert for products intended to appeal to taste preferences for salt, sugar and fat, and look instead for those that make nutrition sense.

Conclusion

Eating quality is a consideration that only you can evaluate. While there are wide differences in flavor, texture and other subjective qualities, individual tastes and preferences will dictate which products are acceptable.

The decision to use convenience products often becomes a trade-off between time available for food preparation, money available for food purchase, nutritional considerations, and of course, eating quality. You must decide for yourself which of these concerns are most important.

Note: The use of tradenames in this publication is solely for the purpose of providing specific information. This does not constitute a guarantee, warranty, or endorsement of the products named and does not signify approval to the exclusion of others.

Suggested Learning Experiences

1. Display food packages of refrigerated, frozen and retort shelf-stable convenience meat for discussion with audience groups.
2. Use empty food packages for participants to analyze label information.
3. Hold a "tasting party" of a variety of convenience meat foods.
4. Handout (master included): "Safe from Store to Table" to assist audience groups in handling meats safely. (Can be made into a transparency.)
5. Handout (master included): "Is It Worth the Difference?" to assist audience groups in comparing cost and convenience. (Can be made into a transparency.)
6. Supermarket Shop-In, Grocery Store Tour for consumer groups.
7. In-store point of purchase mini-display and demonstration for shoppers. Series of single concept mini-lessons; one day per week for a number of weeks.
8. "Lunch-and-Learn" for businesses and industries. Series of three lessons, 30 minutes each (one per unit), or six (two per unit).
9. Science projects on convenience foods, for example, comparing flavor of various forms, or evaluating keeping quality at various temperatures.
10. Articles submitted to newspapers, organization newsletters, high school and college newspapers, magazines, based on fact sheets provided for each unit.

Evaluation Instrument

Evaluation is a tool, not an end in itself. It is the means by which your program and methods can be assessed and made more effective. Evaluation helps you determine how much progress your clientele have made toward their educational objectives.

For concrete evidence of the effectiveness of your program, use one or two evaluation methods. Evaluation sheets and pre-post tests are included in the handouts for each unit.

When you evaluate systematically and objectively, you derive personal satisfaction from sure knowledge that your work has achieved success.

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Unit 2. Shopping a la Carte: Take-out Meats

Contents

	Page
Objectives	16
Concepts	16
Background Information	17
• Nutrition Considerations	17
• Safety Considerations	18
• Economic Considerations	18
Leader Lesson Plan	19
• Advance Preparation Guide	19
• Presentation Guide	19
Handouts	22
• Shopping a la Carte: Take-out Meats-Evaluation	
• Cost of Take-out Eating	
• A Nutrinomic Comparison of Protein Costs	
• Shopping a la Carte: Take-out Meats-Fact Sheets	
Suggested Learning Experiences	23
Evaluation Instrument	24
References	25

Unit 2. Shopping a la Carte: Take-out Meats

Objectives

After completion of this lesson, consumers will be able to:

- 1** Evaluate the impact of take-out and pre-packaged processed (luncheon) meat foods on their time and budget.
- 2** Use sources of nutrition and ingredient information to evaluate nutritional quality of ready-to-eat prepackaged meats.
- 3** Evaluate ingredients/components when buying take-out and pre-packaged processed meats in terms of risk/benefits relative to health.
- 4** Use recommended handling, storage and preparation practices to reduce food waste and incidence of food-borne illness.
- 5** Make informed choices based on individual needs relative to quality, nutritive value, cost, preparation time and lifestyle situation, when purchasing take-out or processed meats.

Concepts

- 1** Convenience meat products offer consumers a wide variety of choices ranging from time-honored canned corned beef hash to gourmet entrees and complete dinners.
- 2** There has been rapid growth in the convenience food industry. Products and services increasingly are offered through supermarkets, convenience stores and neighborhood grocery stores. These include on-site eating places and expanded freezer and deli sections with prepared sandwiches and microwaveable dishes. Education regarding the properties and characteristics of various products would help consumers select convenience foods that best meet their needs.
- 3** Convenience meat products (frozen entrees, prepared dinners, ready-to-eat processed meats and deli meats) offer many advantages such as reduced preparation time, elimination of some preparation steps, increased variety, portion control, reduced leftovers and decreased waste.
- 4** The use of product information such as nutrition labels, ingredient listings and prices per serving can help consumers make informed choices regarding the use of convenience meat products.
- 5** Convenience food products will continue to be an alternative for people when time is more important than money. However, within the context of the family food budget, skills that enable consumers to compare costs and nutrient content will help them determine how much of their budget should be spent on these products.
- 6** To prevent food waste and food-borne illness, convenience meat products, like other meat products, should be handled, stored and prepared by following recommended practices. Care and storage instructions and dates on meat product packages are the best guides to follow.

Background Information

In-home eating is on the rise but the meal has not necessarily been prepared in the home. The biggest change in food consumption today is ready-to-eat food, meals bought at restaurants, take-out shops or supermarket delis, but brought home to eat. Hamburgers and pizza are the foods most often bought for take-out, followed by chicken.

Many supermarkets are expanding their take-out service to meet the consumer demands for convenience. At most modern meat counters you will find such choices as fully cooked roasts, glazed pork chops and breaded veal cutlets. The hot deli section has expanded to include high quality gourmet takeout or delivery service. Meat salads can be found in the deli, fresh salad bar or refrigerated dairy case. Ready-to-eat processed meats such as the well known "old world" sausages can be custom sliced in the deli or prepackaged in the processed meat section. They account for approximately 25 percent of the total meat produced in this country. These processed meats offer convenience, ease of preparation, little waste, portion control, sanitary packaging and ease of refrigeration.

Fast-food outlets have added drive-through windows and offer all their menu items for take-out including the new breakfast and dinner specialties. Restaurants and specialty take-out shops offer old favorites, such as barbecue, as well as upscale gourmet choices of entrees, complete dinners or a catered banquet. Most ethnic restaurants offer take-out service. Among the most popular are Italian pizza parlors and Chinese and Mexican restaurants.

To get the ultimate value out of take-out, ready-to-eat meats, familiarize yourself with the many market choices, forms, variations and prices. Plan to meet your dietary needs. Consider individual nutrient requirements, special diet needs and food preferences. Consider trade-offs in cost and convenience, how often you buy this type of product and the availability of ingredient and nutrition information.

Nutrition Considerations

For everyone who is and should be nutritionally concerned, lean meat provides protein,

iron, minerals, B-complex vitamins and energy. Furthermore, the protein from meat sources is a complete protein, one of high biological value that contains all of the essential amino acids in proportions capable of supporting growth when they are the sole protein source. For those on a restricted diet many convenience prepackaged meats are being modified to lower the fat content and calorie level.

The flavor and convenience of processed meats (luncheon meats) have made them long-standing favorites of the American consumer. However, the fat in these meats is often invisible and varies by the process. The American Heart Association recommends that we get no more than 30 percent of our calories from fat.

It's easy to calculate what your daily intake of fat calories would be to comply with the recommended level of 30 percent calories from fat. If you take in 2,000 calories per day, you would limit fat calories to 2,000 calories per day times 30 percent = 600 calories per day from fat recommended. At 1,700 calories per day, you would limit fat calories to 1,700 calories per day times 30 percent = 510 calories per day from fat.

Meat processors are working to produce reduced fat versions. The modified version of bologna is 39 percent lower in fat and has 21 percent fewer calories than the traditional version. A modified version of corned beef (Oscar Mayer Select Slices®) is 67 percent lower in fat and has 36 percent fewer calories but is higher in sodium. The modified versions of pastrami are 76 to 92 percent lower in total fat and have 60 to 72 percent fewer calories than the traditional product but contain a comparable amount of sodium. Modified cooked ham is 36 to 50 percent lower in calories and 61 to 74 percent lower in fat than the traditional version.

Several modified versions of beef or pork frankfurters (wieners, hot dogs) are now available. Modified beef franks are 23 percent lower in calories and 39 percent lower in fat than the traditional beef franks.

Salt, which is 40 percent sodium, is added to processed meats to help preserve the meats, and to add to their distinctive textures and flavors. Americans generally eat more salt than they need. The recommended level for

sodium intake is 1,100 to 3,300mg daily. Luncheon meats provide around 250 to 300mg per slice. Sodium is listed in the nutritional information on prepackaged meats.

The nutritive value of ready-to-eat meats prepared and distributed at point-of-purchase (restaurant, deli, take-out specialty shop or supermarket meat counter) will depend on the ingredients used and preparation technique. Food "made to order" makes it easy to request items prepared the way you like. Before ordering, ask how the food is prepared. If you're trying to cut down on calories and fat, avoid rich sauces and foods that are fried and breaded. If the visible fat is not removed before cooking, remove it before eating.

To ensure that consumers get meat when they believe that's what they're buying, the USDA has established standards for many processed and ready-to-eat meat and poultry products. All prepackaged meat must have ingredients listed in order by weight.

To get the most for your money read the label. Look for products with meat listed first or second on the list of ingredients and compare nutritional content of similar products.

Safety Considerations

In choosing hot-prepared deli items, consider the length of time the food has been in the warmer of the deli case. This holding will affect the taste, texture and the nutritional quality. With refrigerated deli meats, consider the number of times they have been removed from the refrigerated case and handled for slicing.

The number of foods prepared on-site ready to serve in the store is increasing. These usually are not labeled to inform consumers about shelf-life, cooking procedures and storage tips. Consumers should be aware of the dangers of holding these highly perishable foods in the "danger zone," above 40° F or below 140° F. Because each time food is cooled or reheated it goes through the "danger zone," treat these ready-to-eat meats as any other perishable food. Keep hot food hot, above 140° F, and cold food cold, below 40° F. They should not be left at room temperature for more than two hours. When you shop, bring perishables home immediately and either serve or refrigerate them.

Economic Considerations

The cost of processed (luncheon) meats is often higher than home-made cold cuts. Buying a whole roast, then cooking, slicing and freezing it at home is considerably less convenient than popping a few plastic packages into the refrigerator. Once the work is done, however, the meat is just as conveniently available, probably at a lower price and with a lower salt and fat content.

The eating quality of custom sliced and deli prepared take-out foods may be hard to judge. These foods typically have no labels with ingredient lists or information about handling and serving the food.

Leader Lesson Plan

Advance Preparation Guide

1. Review Unit 2 teaching packet carefully.
2. Prepare enough handouts for each group member. Make sure participants complete Shopping a la Carte: Take-out Meats-Evaluation.
3. Purchase at least three pairs of regular and reduced-fat luncheon meats, such as bologna and reduced-fat bologna and ham and turkey ham. Participants will do a blind taste comparison. Make arrangements to keep meats properly chilled (below 40° F) until time for the taste test. (Check with your Extension Home Economics Agent or leader of your sponsoring group to see if money is available for purchasing the sample products. If not, a local merchant may be willing to donate them for the educational program.)
4. Complete the "Comparison Chart" (enclosed) from the label information of the meat products, to enable you to describe the fat, calorie and sodium content of each version of the meat pairs.
5. Gather serving plates, knives, toothpicks or forks, and prepare hidden labels to identify each type of meat.
6. For a grocery store tour, you will need to prepare as follows:
 - a. Talk to the store manager to get permission for the tour. Explain your purpose. Ask what day and time would be agreeable, and how many people you could "tour" at one time.
 - b. Tour the store by yourself ahead of time. Find examples of each type of convenience meat product you will discuss. Plan for at least one concept of learning from each item, whether it be type of processing, labeling information, cost comparison with home prepared or other types of convenience foods, amount of work saved at home or others.
 - c. Analyze your audience in terms of the length of time it will take to complete your tour. Be sure to stay within the "time tolerance" of your audience.
 - d. Prepare your audience for what is to come, during the class session prior to the tour, or for a brief period immediately prior. Explain your purposes. Tell them exactly what they will do on the tour and what concepts you hope to demonstrate from it.
 - e. Remember that you are an ambassador of your organization. Replace every item exactly as you find it. Do not interfere with the store's customers in their shopping chores. Comply with any instructions you receive from the store personnel.

Presentation Guide

Setting the Stage

To get the audience's interest:

At beginning of session, have several pairs of plates on display, each pair containing the regular and reduced-fat version of one type of luncheon meat. Label each pair of plates as to the type of meat (bologna, salami, ham, hot dogs, etc.). Label each plate so that only you can see (tape on the bottom of the plate is a good idea) which version it is, either regular or reduced fat. It would be helpful to have the package labels for each product, if it is possible to clean them and preserve them once they have been opened.

Either a few volunteers or each of the group members (depending on the size of the group) can then sample each pair of products and do a "blind taste test." Ask them to compare the saltiness, texture, moistness and flavor of each pair. After participants have decided which type they prefer, reveal which is the reduced-fat version, and tell the group the fat, sodium and calorie content from your Comparison Chart. Explain objectives in your own words.

EXPLAIN: The types of meat foods this lesson will cover: luncheon meats, sandwich meats, deli meats or cooked sausages (that is, ground or chopped meat combined with salt, seasonings and other ingredients that may be stuffed into a casing or container and are frequently sold pre-sliced. They may be smoked. Examples are hot dogs, bologna, salami and

For Leaders

Shopping a la Carte:
Regular and Reduced Fat
Luncheon Meat Comparison Chart

Leaders: Fill in the information below for the meats you will use in your "taste-test interest getter" activity.

Type of Meat	Serving size*	Calories per serving	Fat (g)	Sodium (mg)
Type of Meat (e.g., bologna) _____				
Regular	_____	_____	_____	_____
Reduced fat	_____	_____	_____	_____
Type of Meat _____				
Regular	_____	_____	_____	_____
Reduced fat	_____	_____	_____	_____
Type of Meat _____				
Regular	_____	_____	_____	_____
Reduced fat	_____	_____	_____	_____
Type of Meat _____				
Regular	_____	_____	_____	_____
Reduced fat	_____	_____	_____	_____
Type of Meat _____				
Regular	_____	_____	_____	_____
Reduced fat	_____	_____	_____	_____
Type of Meat _____				
Regular	_____	_____	_____	_____
Reduced fat	_____	_____	_____	_____

*Give serving size in number of slices if available; if not, use ounces.

pepperoni). The lesson also covers cooked ham or roast meats such as beef or turkey, and meats which are sold at delicatessens or the deli department of supermarkets.

Teaching Steps

HANDOUT: "Shopping a la Carte: Take-out Meats." Have participants complete the evaluation.

DISCUSS: The nutritional qualities of these meats. Stress that they can be included with moderation in a varied and balanced diet.

DISCUSS: Food safety considerations of deli/take-out meats. Include a discussion of holding time, heating and cooling and lack of labeling information.

DISCUSS: Economic considerations of deli/take-out meats. Help participants understand that they spend extra money to get the convenience, and only they

can decide if it is worth it. Many consumers, however, do not know just how much they do spend for take-out meats.

HANDOUT: "Cost of Take-out Eating" to help participants evaluate their own meal management.

DISCUSS: Deli take-out meats from a nutrinomic standpoint - that is, in terms of nutritional value for money spent. A comparison of protein content can help participants understand this concept.

HANDOUT: "Nutrinomic Comparison of Protein Cost" Have participants complete the worksheet.

HANDOUT: "Shopping a la Carte: Take-out Meats-Fact Sheets."

SUMMARIZE: Briefly restate your main points.

Handouts

- Shopping a la Carte: Take-out Meats–Evaluation
- Cost of Take-out Eating
- A Nutrinomic Comparison of Protein Costs
- Shopping a la Carte: Take-out Meats–Fact Sheets

Shopping a la Carte: Take-out Meats Evaluation

Circle true or false.

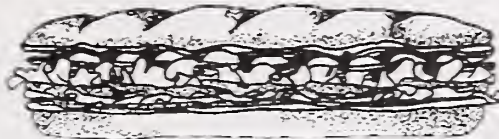
1. T F Protein has more than twice as many calories per gram as carbohydrate and fat.
2. T F Generally, luncheon/sandwich/deli meats are high in fat and calcium.
3. T F Take-out meals from a deli or restaurant often are priced lower than the same food made at home.
4. T F Smoked turkey breast, 97 percent fat free, has 3 percent of its calories from fat.
5. T F The American Heart Association recommends that we get no more than 50 percent of our calories from fat.
6. T F Money, time available and nutritional considerations all influence your decision to buy take-out foods.
7. T F There is no place for deli/luncheon/sandwich meats in a healthy balanced diet.
8. T F There are three types of sausages: cooked, cooked-smoked and specialty meats.
9. T F Ease and convenience is the main advantage to buying take-out food. It requires no cooking, saves time and requires very little clean up.
10. T F In general, a carry-out meal costs less than a similar meal in a restaurant.

1. F Fat has more calories per gram.
2. F They are high in fat and sodium.
3. F Take-out meals are usually priced higher.
4. F Approximately 26 percent of its calories are from fat.
5. F The AHA recommends only 30 to 35 percent.
6. T
7. F Eaten in moderation, these meats may be part of a healthy diet.
8. F The fourth type of sausage is dry/semi-dry.
9. T
10. T

Shopping a la Carte: Take-out Meals Cost of Take-out Eating

Some families use lots of take-out foods. This can be very costly. A take-out meal may be a hamburger and soft drink, a pizza or a meal from a deli or fancy restaurant. Regardless of the type of meal, you are paying for many things besides the food.

In the chart below, list the take-out meals your family eats in a week. Include those eaten by the whole family, or by an individual member. List the price per meal (estimate if you need to), then add up the total at the bottom.



Take-out meals eaten by my family	
Meal	Price
	Total

- Could you have prepared an equivalent meal at home for less cost?
- Are the extra services of preparing the food worth the money you spent?
- Are the take-out meals as nutritious as if you prepared them at home?





A Nutrinomic Comparison of Protein Costs

Use the chart below to compare protein costs among different types of meats. Fill in local price per pound of each meat type in column B. Then divide the price in column B by the number in column A to get the cost per gram of protein.

Meat	Column A Grams of protein- per pound	Column B Cost per pound (use local prices)	Cost per gram of protein (divide col. B by col. A)
Salami	64	\$ _____	
Hot dogs	50	\$ _____	
Bologna	56	\$ _____	
Chicken breast	144	\$ _____	
Beef chuck roast	100	\$ _____	
Sirloin steak	122	\$ _____	
Loin pork chops	127	\$ _____	

CONVENIENCE



Shopping a la carte: Take-out Meats— Fact Sheets

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Introduction

Buying take-out food is a widespread American phenomenon. Ready-to-eat food has come into its own, just as ready-to-wear clothes once did. As a result, consumers can enjoy dinner fares of traditional sit-down restaurants without entering the restaurant that prepared their dinner. And to avoid having to mix their own ham salad, consumers spend an extra \$1.45 to buy the same quantity already prepared.

Consumers have choices of ready-to-eat from the grocery deli, a fresh salad bar, take-out specialty shops, drive-through window of fast food restaurants, pick-up from convenience stores and a choice of meals delivered to park picnic, home table or office desk.

Many restaurants never before involved in carry-out business are offering part or all of their menus for carry-out. Supermarkets are sending part of their food to consumers in prepackaged, ready-to-eat forms. More and more supermarkets have full-service deli caterers and self-service soup and salad bars. Fast food sales in convenience stores are increasing rapidly, some teaming up with fast food restaurants to cook hamburgers in the store. Similar ventures are being tested with fried chicken and pizza chains.

The restaurants have introduced mobile units and are operating outlets in new locations, such as schools and college campuses, hospitals, military bases, toll roads, bus terminals, retail stores, shopping malls, central city office buildings, recreational sites and international markets. More foods have been added in response to demand from health and diet-conscious individuals. Menus include such items as salad, entrees, pasta dishes, baked potatoes, gourmet burgers, more fish and chicken items, soups, low-fat milk and whole grain buns. Most fast food outlets with drive-

through windows have introduced take-out breakfast and dinner specialties, extended operating hours and a catering business to get full use of equipment.

Buying a Main Dish or Entree

Supermarkets

The Meat Department: This department in the supermarket carries prepared or partly prepared dishes. You may find fully cooked ready-to-eat beef roast, glazed pork chops, breaded veal chops and cutlets or barbecued ribs and many other choices.

The Deli Section: In many leading up-to-date supermarket delis, you will find a high-quality take-out section with enough prepared hot and cold dishes—appetizers through dessert—to cater a banquet. Entrees can range from stuffed veal loin to old favorites like corned beef and cabbage, lasagna or Swedish meatballs. However, in the hot food service counter, the menu most often is pretty basic including such items as fried or barbecued ribs, baked macaroni and cheese, stuffed cabbage or peppers, beef stews, spiced sausage mixes, meatballs and sauces.

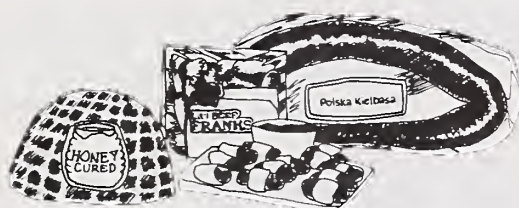
The deli entrees are usually the most expensive in the store. In return, you will be spared the labor and time required for preparation. And certainly you should expect a superior product in flavor and appearance.

Meat and Poultry Standards

To ensure that consumers get meat when they believe that is what they are buying, the U.S. Department of Agriculture has established standards for meat products. Standards of the more popular ready-to-eat products are listed below.

USDA Standards for Popular Meat and Poultry Products

Product Name	Standard
Beef stew	Must contain at least 25 percent beef.
Chili con carne	At least 40 percent meat.
Frankfurter, bologna and similar cooked sausage	May contain only skeletal meat. No more than 30 percent fat, 10 percent added water and 2 percent corn syrup. No more than 15 percent poultry meat.
Frankfurter or bologna "with by products" or "with variety meats"	Same limitations on fat, added water and corn syrup as products without variety meats. Must contain at least 15 percent skeletal meat, and the terms "variety meats" or "by products" must be part of the product name and in the ingredients list.
Ham: water added, cooked or cooked and smoked	Must be from the hind legs of a hog; picnic hams are from the front legs. Both must contain at least 17 percent meat protein (fat-free).
Nuggets	Bite-size, solid pieces of meat and poultry. Usually breaded and deep fat fried.
Pizza with sausage	At least 12 percent cooked sausage or 10 percent dry sausage, such as pepperoni.
Turkey ham	Cured turkey thigh meat.



Cold Cuts Section: Processed Meats

Call it luncheon meat, deli meat or cold cuts, those little see-through packages of sliced bologna, ham and salami that you find on pegboards above supermarket meat counters are a boon to sandwich preparers who have little time to fuss over brown-bag lunches.

Processed meats—those widely used but misunderstood, ready-to-use meat products—have earned their place on tables in the United States at home and away. Before Oscar Mayer introduced vacuum-sealed, packaged luncheon meats in 1950, consumers went to their local delicatessens and requested meats sliced-to-order. Today, presliced, prepackaged luncheon meats, or "processed meats," account for about 30 percent (by weight) of the total meat produced in this country. Certainly processed meats offer us convenience—ease of preparation, little waste, portion control, sanitary

packaging and ease of refrigeration. Add to these qualities their versatility and flavor appeal, excellent keeping qualities, energy and laborsaving pre-preparation and ready-to-serve state, plus the excellent nutritional contribution of meat.

Pork represents the largest single species of meat processed, both as cured and smoked products as well as the major meat in sausages. Except in the case of all-beef products, pork is usually the principal meat used in processing. A great deal of beef as well as some veal, lamb or mutton and variety (organ) meats may be used in specific products, depending upon the recipe or formulation.

Certain sausages may contain binders and extenders which must be prominently labeled as such; for example, cereal, vegetable starch, starchy vegetable flour, soy flour, soy protein concentrate, isolated soy protein, nonfat dry



milk, calcium reduced dried skim milk, enzyme (rennet) treated calcium reduced skim milk and calcium lactate or dried milk. The finished product shall contain no more than 3.5 percent of these additives individually or collectively.

In reality, then, sausage is merely ground meat, salted for preservation and seasoned to taste. Beyond that, it may be prepared in various shapes or forms for handling purposes or attractiveness or "eye appeal," but fundamentally it is just meat and seasonings.

Ready-to-Eat Sausage Choices

Many Old World sausage formulas have accompanied people to all corners of the globe, so that today 1,200 or more kinds and varieties of sausages are known and sought all over the world. Despite the myriad of names identifying sausages, there are basically only four types of ready-to-eat sausages. Within this classification system, there are many variations relative to ingredients, seasonings, form or other characteristics, but the basic features and manufacturing process would hold true for all within the given classification as follows:

Cooked Sausages - made from uncured meats, ground, seasoned, stuffed into casings and cooked, but not smoked. Usually served cold. Examples: Braunschweiger Liver Sausage and Liver-Cheese.

Cooked, Smoked Sausages - made from cured meats, chopped or ground, seasoned, stuffed into casings smoked lightly and then fully cooked. Do not require further cooking before consuming but often heated before serving. Examples: Berliner, Bologna, Cotto Salami, Frankfurters, Smokie Links and Wieners.

Dry or Semidry Sausages - sometimes called Summer Sausage, made from cured meats that are comminuted, seasoned, stuffed and air dried under controlled time temperature humidity conditions. These sausages are fermented under controlled conditions and feature a distinctive, slightly lactic acid flavor. These may or may not be smoked before drying. Examples: Cappelletti, Chorizos, Farmer Cervelat and Frizzes.

Specialty Meats - encompass a wide variety of products that have in common only the fact that they are chopped or comminuted meats that are seasoned and usually cooked or baked rather than smoked. These are made from cured or uncured meats, often in

loaves, but usually sliced and served cold. Examples: Chopped Ham Loaf, Condiment Loaf, Head Cheese, Jellied Corned Beef, Minced Ham, Peppered Loaf, Scrapple, Souse and other varieties of luncheon meats.

Nutrition Value

For everyone who is, and should be, nutritionally concerned, processed meats in all of their unique and varied forms are excellent sources of protein, energy, minerals and B-complex vitamins. Furthermore, this protein from meat sources is a complete protein, one of high biological value, that contains all of the essential amino acids in proportions capable of supporting growth when they are the sole protein source. In addition, these processed meats are highly digestible (93 to 98 percent) and have a high satiety value both in distinctive flavor as well as lasting in effect.

Reduced fat versions of prepackaged luncheon meats are becoming increasingly available. The modified version of bologna is 39 percent lower in fat and has 21 percent fewer calories than the traditional version. A modified version of corned beef is 67 percent lower in fat and has 36 percent fewer calories but is 24 percent higher in sodium. The modified versions of pastrami are 76 to 92 percent lower in total fat and have 60 to 72 percent fewer calories than the traditional product but contain a comparable amount of sodium. Modified cooked ham is 36 to 50 percent lower in calories and 61 to 74 percent lower in fat than the traditional version.

Several modified versions of frankfurters are available, including chicken franks, turkey franks and modified beef franks. Chicken franks are 18 percent lower in calories, 32 percent lower in total fat and 54 percent lower in saturated fatty acids, but have 34 percent more sodium than the traditional beef frank. Turkey franks and modified beef franks are 23 percent lower in calories and 39 percent lower in fat than the traditional beef franks. The table "Nutritive Value of Selected Low or Reduced Fat Processed Meats" gives nutritional values for some lower fat meats.

About half the manufacturers of presliced luncheon meats provide nutrition information on their labels. The most complete labels include calories, grams of fat, carbohydrate, protein, as well as milligrams of cholesterol and sodium. Some products fail to list cholesterol, while others omit sodium from their labels.

To compare the nutritional content of similar products from different manufacturers, it's important to compare serving sizes as well. Most luncheon meats come as 28g (1 ounce) slices. But buyer beware! Some slices can weigh as much as 68 percent less.

The table, "Nutritive Value of Selected Processed Meats," lists the composition of selected sausages and sliced ham, giving values for food energy (calories) and eleven nutrients, for some common portions, as presented in *USDA Agriculture Handbook No. 8-7 Composition of Foods - Sausages and Luncheon Meats*, the latest up-to-date source.

Fat. The percent of calories from fat varies among different manufacturers of the same product.

The belief that ham is a high-fat meat is a hard one to shake. In reality, the composition of pork has changed over recent years, yielding a product which is leaner and, in some cases, lower in calories and fat than turkey. A slice of Butterball Turkey Bologna, for example, has more than four times as many fat calories as a slice of Oscar Mayer Cooked Ham!

Cholesterol. Not all products offer information about their cholesterol content on the label. Of products that provide the information, cholesterol ranges from a low of 5mg in a slice of Oscar Mayer Corned Beef to a high of 50mg in a slice of Oscar Mayer Braunschweiger Liver Sausage, also called liverwurst. Just as turkey and chicken products do not always have the lowest fat content, neither do they always contain the least amount of cholesterol. In fact, a 22.6g slice of Wampler Longacre Turkey Salami contains 25 percent more cholesterol than a 28g slice of Oscar Mayer's Beef Bologna. The difference is most likely due to the added turkey gizzards and turkey hearts in the Wampler product.

Sodium. Salt is an essential ingredient in the curing of processed meats. Its presence increases shelf-life and enhances flavor. Nitrates, often in the form of sodium nitrate, help in preservation and contribute to the flavor and color of cured meat products. There seems to be no consistency in which types of luncheon meat are lowest in sodium.

To decrease the amount of sodium in luncheon meats, rinse the slices under cold water and pat dry prior to eating. Remember, however, that you're also washing away the preservative effects of salt that make the meat safe

for storing. Luncheon meat that has been rinsed should be eaten right away and not returned to the refrigerator.

Tips for Getting the Most From Processed Meats

The ultimate value of processed meats can be enhanced in use by following these guidelines:

- Familiarize yourself with the many market forms, variations and sizes of processed, cured and canned meat products. Get to know retail meat departments.
- Identify who and how many will eat the product.
- Plan to meet the consumer's dietary needs. Consider individual nutrient requirements, special dietary needs, food preferences.
- Determine how to prepare/present the product in meals and snacks, for special occasions.
- Analyze storage facilities—do not overbuy. Once opened, processed meats are generally best used within one week, especially low-sodium products.
- Store products promptly, carefully, in a very cold (35° to 38° F) refrigerator. Rotate products regularly.

Processed meats, well-used, offer many benefits to consumers both at home and away.



Take-out Specialty Shops

In the United States today, the number of women in the work force is growing fast. At the same time, more men are managing their own food. A skyrocketing demand for prepared meals has inspired a new kind of take-out store.

The take-out shops sell fully prepared, often gourmet, dishes instead of the cured meats, simple salads and standard relishes of yesteryear. Foods from these specialty places cost more, but they're becoming popular foods once enjoyed only by the elite.

The new take-outs, as a whole, appeal to customers who want high-quality prepared dishes and seasoned salads. Also, these dishes



Nutritive Value of Selected Low or Reduced Fat Processed Meats

Product	Serving Size	Calories	Protein (gm)	Fat (gm)	Iron (% USRDA)	Sodium (mg)
Cooked ham (98 %fat free)	1 slice (1 ounce)	25	5	1	NA	380
Turkey Ham (96 % fat free)	1 slice (1 ounce)	35	5	1	NA	390
Turkey Bologna (80 % fat free)	1 slice (1 ounce)	70	4	6	NA	370
Lean Pastrami	1 ounce	40	5	2	4 %	NA
Lean Corned Beef	1 ounce	40	5	2	4 %	NA

Nutritive values for these products have not been published in USDA Handbook No. 8. Nutritive values for this table were obtained from nutrition labels on food packages.

Nutritive Value of Selected Processed Meats

Product	Portion size	Food		Ascorbic					Ribo-		Vitamins		
		energy	Protein	Fat	Iron	Sodium	Zinc	Acid	Thiamin	flavin	Niacin	B-6	B-12
		Kcal	(gm)	(gm)	(mg)	(mg)	(mg)	(mg)	(mg)	(mg)	(mg)	(mg)	(µg)
Bologna (beef, pork)	2 1/2 slices 57g	180	6.66	16.11	0.86	581	1.11	12	0.10	0.08	1.47	0.11	0.76
Bratwurst (pork, cooked)	1 link 85g	256	11.97	21.99	1.10	473	1.96	1	0.43	0.16	2.72	0.18	0.81
Braunschweiger (beef, pork)	3 slices 54g	194	7.29	17.33	5.05	617	1.52	5	0.13	0.82	4.52	0.18	10.85
Dutch Brand Loaf (pork, beef)	2 slices 57g	136	7.65	10.16	0.70	713	0.98	10	0.17	0.15	1.35	0.13	0.75
Frankfurter (beef, pork)	1 link 45g	144	5.08	13.12	0.52	504	0.83	12	0.09	0.05	1.18	0.06	0.58
(10 per pound)													
Head cheese (pork)	2 slices 57g	120	9.07	8.99	0.66	716	0.74	12	0.02	0.10	0.64	0.11	0.60
Kielbasa (pork, beef, non-fat dry milk added)	3 slices 85g	285	11.27	23.08	1.23	915	1.72	18	0.19	0.18	2.44	0.15	0.71
Liver sausage (pork)	3 slices 54g	176	7.63	15.41	3.46	—	—	—	0.15	0.56	—	—	46.22
Salami, dry or hard (pork, beef)	4 slices 40g	167	9.14	13.76	0.60	744	1.29	10	0.24	0.11	1.95	0.20	0.76
Smoked Sausage (pork, beef)	1 link 85g	266	11.29	23.47	1.25	1,170	1.67	18	0.16	0.18	2.42	0.15	1.33
Thuringer (beef, pork)	2 slices 46g	160	7.38	13.77	0.94	668	0.93	11	0.08	0.14	1.88	0.14	2.12

Source: Kinsman, D.M. 1982. A fresh look at processed meats. Food and Nutrition News. 53 (5):1.

are often more nutritious than traditional carry-outs.

East coast, west coast and in between, the newer stores strive for the flavors considered popular or "sophisticated." Green peppercorn sauce or bearnaise sauce accompanies tournedos of beef. Salads are made with tri-colored pasta and herb flavors. A long-grain wild rice salad is dressed with virgin olive oil and herb vinegar.

Some prices: Glazed pork chops may cost \$9 per serving, compared with \$3.99 in a super-market take-out. For \$9, the flavors are probably more delicate.

Restaurant Take-outs

In 1985, more than one-third of all lunch orders were eaten off premises. Take-out traffic for midday meals jumped almost 30 percent between 1982 and 1985 and take-out dinners more than doubled. During the same time, the number of diners eating lunch or dinner inside the restaurant declined. As a result, off-premises dining (take-out dinners) now accounts for more than 25 percent of dinner sales.

American cooking leads all types of cuisine. When it comes to take-out, the popular barbecue has been around a very long time and is expanding with the organization of national chains. Popular take-out offerings in the meat category include pork, ribs, cuts from the shoulder and barbecue beef roasts.

Sandwich shops have been providing take-out for years. After all, Americans love sandwiches. A recent survey found that more than a third of the population eats deli meat sandwiches two to three times a week.

What deli meat sandwich is the favorite? Thirty percent of the respondents picked ham. A close second, preferred by 28 percent, was the traditional trio: bacon, lettuce and tomato. Corned beef took third, followed by pastrami, salami, bologna, submarine and liverwurst sandwiches.

The nationwide survey found that people choose the deli sandwich for a quick, delicious meal that is nutritious. They choose lettuce, cheese and tomato to dress up their favorite sandwiches with a flavor and nutritional boost.

Ethnic foods enjoy take-out popularity too. Chinese take-out dinners are still popular and

still good buys compared with expensive take-out shops. Italian food, although perceived as high in calories and fat, can fit into a healthful diet — pasta with a tomato-based meat sauce makes a low-fat, high protein choice. Heading the list of Italian take-out foods is the pizza, with a variety of sausage toppings.

Take-out Foods in Your Diet: Get a Good Fit

To balance the meals you carry home, choose a variety of proteins in small portions, plus whole grains, breads and cereals, and fruits and vegetables.

Also, keep these tips in mind:

- Resist high-fat choices, including rich sauces. Keep total fat intake to no more than 30 percent of calories. Remember: All fats have twice the calories found in proteins or carbohydrates.
- Lean toward less-saturated dressings, such as oil and vinegar, rather than creamy, egg-based ones.
- A small meat component in a take-out dish is better economy than a large, well-marbled steak in a rich sauce, but nutritive value should be evaluated.
- Include foods with good fiber and bulk—whole-grain breads, bulgur salad, wild rice or brown rice salads, for example.
- Choose herb-seasoned dishes instead of pickled or brined foods. Ask for lower-salt choices.
- Opt for fruit desserts and smaller dessert portions. Avoid the temptation of dessert instead of dinner.
- Add some milk to your meals. Skim milk, buttermilk and yogurt in containers will keep well in the refrigerator.

Budget

Buying take-out food is largely an impulse or unplanned purchase decision. The impulse or unplanned buying is a problem when it comes to fitting the purchase into a nutritious diet and a balanced food budget. The average person purchases take-out food 1 1/2 times a week at a cost of \$16.50 per week, adding up to

about 15 percent of Americans' at-home food dollars.

Ease and convenience are the main advantages to buying take-out food. It requires no cooking, saves time and requires very little clean-up.

Being fatigued or rushed is another important reason to turn to take-out food. When you come home late, when you are too busy to cook, and when you are in a hurry, take-out may be an option.

The need for a special treat is a third reason why you might opt for take-out food. You can enjoy a fun meal after getting through the tough week.

The cost can run from low to high, depending on what and where you buy. In general, a carry-out meal costs less than a similar meal in a restaurant (and there's no tip).

It's easy, and usually correct, to conclude that fresh-prepared take-out foods cost more overall than home-prepared or commercially frozen foods.

These take-out products may not be suitable for use by consumers on a tight food budget. But simply comparing costs will not tell the whole story on ready-prepared, ready-to-eat, take-out meals. For employed homemakers and other hard-working consumers who come home hungry and tired, an occasional something delicious, nutritious and easy to serve (no cooking or defrosting) nourishes more than the body.

The decision to use take-out products such as dinners, entrees and salads often becomes a trade-off between time available for food preparation, money available for food purchase, nutritional considerations and, of course, eating quality. Consumers must decide for themselves which of these concerns is most important.



vs.



Take-out Costs: Supermarket vs. Upscale Take-out vs. Made at Home

Food item	Super market take-out	Price-per-pound	
		Specialty take-out	Made at home
Ham Salad	\$3.38	\$5.00	\$1.95
Filet Mignon	8.89	15.00	6.79
Stuffed Loin of Veal	N/A	18.50	9.19

Prices are from the Gainesville, Florida area, November 1988, and may vary in your area.

N/A = Not Available.

Note: The use of tradenames in this publication is solely for the purpose of providing specific information. This does not constitute a guarantee, warranty, or endorsement of the products named and does not signify approval to the exclusion of others.

Suggested Learning Experiences

1. Taste-test comparison of regular and reduced-fat processed luncheon meats. Arrange bite-size pieces so participants cannot tell which is which. Identify after all samples are tested.
2. Handout (master included): "Cost of Take-out Eating" to help participants analyze portion of their budget currently spent for takeout food.
3. Handout (master included): "A Nutrinomic Comparison of Protein Costs" to help participants analyze the relative cost of protein from meat foods they eat.
4. Mock talk-show, with leader as emcee. "Guests" could include a fast food restaurant manager, deli supervisor and a dietitian. Emcee should have discussion questions prepared ahead of time for discussion with each guest. Wrap up with panel for questions from the audience.
5. Guest appearance on local television or radio talk show. Prepare questions and answers ahead of time.

Evaluation Instrument

Evaluation is a tool, not an end in itself. It is the means by which your program and methods can be assessed and made more effective. Evaluation helps you determine how much progress your clientele have made toward their educational objectives.

For concrete evidence of the effectiveness of your program, use one or two evaluation methods. Evaluation sheets and pre-post tests are included in the handouts for each unit.

When you evaluate systematically and objectively, you derive personal satisfaction from sure knowledge that your work has achieved success.

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Unit 3. Eating Out: Your Guide to Good Eating

Contents

	Page
Objectives	27
Concepts	27
Background Information	28
• Nutrition Considerations	28
• Economic Considerations	30
Leader Lesson Plan	31
• Advance Preparation Guide	31
• Presentation Guide	31
Handouts	32
• Eating Out: Your Guide to Good Eating–Pre-Post Test	
• Compare One Day–At Home or Away?	
• Fast Food Meals: Cut the Fat and Sodium	
• Is It Worth the Difference?	
• Fast Food and Restaurant Meats: Time Comparison Worksheet	
• Fast Food and Restaurant Meats: Cost Comparison Worksheet	
• Test Your Fast Food Savvy	
• Eating Out: Your Guide to Good Eating–Fact Sheets	
Suggested Learning Experiences	33
Supplementary Resource Materials	34
Evaluation Instrument	35
References	36

Unit 3. Eating Out: Your Guide to Good Eating

Objectives

After completion of this lesson, consumers will be able to:

- 1 List advantages and disadvantages of fast food and restaurant meat products.
- 2 Use sources of nutrition and ingredient information to evaluate fast food and restaurant meat entrees in terms of an adequate diet.
- 3 Calculate total day's food intake and adjust as needed to complement away-from-home meat entrees.
- 4 Evaluate economic and time considerations of fast food/ restaurant meat entrees and determine if the higher cost is worth the convenience.

Concepts

- 1 Restaurant meat products offer consumers a wide variety of choices ranging from time-honored hamburger to gourmet entrees and dinners.
- 2 There has been rapid growth in the restaurant industry. Products and services are increasing, including on-site eating places, take-out and catering. Education regarding the properties and characteristics of various products would help consumers select restaurant foods that best meet their needs.
- 3 Restaurant meat products offer many advantages such as no preparation time, increased variety and portion control.
- 4 The use of product information such as menu descriptions, ingredient listings and nutrition analyses (where available), can help consumers make informed choices regarding the use of restaurant meat products.
- 5 Restaurant food products will continue to be an alternative for people when time is more important than money. However, within the context of the family food budget, skills that enable consumers to compare costs and nutrient content will help them determine how much of their budget should be spent on these products.
- 6 With the increased consumption of foods away from home, what Americans eat when they eat out is of importance to their overall health and nutritional well-being. Meat is a nutrient-dense food and is important in away-from-home meals. Knowledge of the nutritional value of meat dishes at home or away enables consumers, including those on special diets, to make wise dietary choices.

Background Information

Today Americans eat more than a third of their meals and snacks away from home and spend nearly half of every food dollar at restaurants.

When consumers dine out, as they are doing more than ever before, they are not leaving their taste for a healthy diet at home. So more and more restaurants are changing their menus to satisfy a calorie-counting, nutrition-conscious clientele.

The fast food industry is finding new ways to prepare and serve food quickly and efficiently so that diners can eat heartily without a great investment of time and money. Choices are widening and consumption is increasing.

Even convenience stores and gas stations are introducing fast foods and limited menu items such as prepared meat sandwiches and microwaveable meat dishes. Neighborhood grocery stores are offering expanded deli and ready-to-eat entrees.

At the present time, the majority of consumers regard taste, price and convenience as important factors when choosing a fast food place. Several trends suggest that consumers are increasingly sensitive to the nutritional quality of food including fast food menu items.

Nutrition Considerations

Many consumers are concerned about the relationship between diet and health. A factor for consumers to consider in purchasing "fast food" and restaurant meats is the nutritional value.

Meat foods are rich in protein, iron and trace minerals. They are an important part of the diet, especially for women and children, who are more likely than men to have diets with inadequate iron intake. A 3-ounce portion of cooked lean meat provides 20.5g of protein, 2.5mg of iron, only about 9g of fat, 200 calories and 70mg of sodium.

With thoughtful planning and being selective you can enjoy fast food and meet your essential nutrient needs. The secret is to choose your food wisely both at fast food restaurants and at home.

Fast food menus offer more choices today, including lighter, leaner selections for those who can't afford extra calories and fat. At most restaurants you will find smaller burgers and entrees for light appetites as well as the choice of preparation methods—broiling, baking and grilling meats, instead of frying which can multiply calories and increase fat content.

In recent years most large fast food chains have analyzed the nutrient content of their food offerings. Evaluations of these offerings by nutrition and diet experts indicate that fast foods often are good sources of protein; and some items provide 20 to 30 percent of recommended allowances of thiamine (B₁), riboflavin (B₂), vitamin C, calcium and iron. A beef patty or roast beef sandwich will boost substantially the iron contribution. Making wise choices will help you get your essential nutrients without going overboard on calories, fat or sodium.

The trend toward more healthful meals can be seen in local neighborhood restaurants, company cafeterias and upscale gourmet establishments.

Many full-service restaurants are offering lighter dishes emphasizing freshness, quality, regional cooking and seasonal foods. Compared to fast food places, they enjoy greater flexibility to adapt menus and preparation methods quickly to meet changing consumer preferences. Indeed, restaurant owners have become sufficiently aware of nutrition conscious clientele that the National Restaurant Association has published a guide for incorporating healthful food into recipes and menus.

To respond to the demand for lean meat and food prepared without sauces, butter and salt, some restaurants will alter the way they prepare food at the diner's request, and almost all will serve sauces and salad dressings on the side or cook without salt.

A growing number of restaurants are actively promoting nutritious or low-calorie fare. Some highlight nutritious items on the menu, or even have a separate menu for health-conscious diners. At other restaurants, the waiters and waitresses tell their customers about especially healthful menu items.

To assess the adequacy of a meal, ("Compare One Week—At Home or Away") remember these general guidelines for nutrition.

A healthful diet should include a variety of foods chosen from the Daily Food Guide and eaten in quantities appropriate to the individual's energy (calorie) needs. (You may notice that the following groups differ from the

"Basic Four" you are used to seeing. These groups are based on the USDA Dietary Guidelines for Americans, specifically the guideline "Eat A Variety of Foods.")

Daily Food Guide	Suggested Daily Servings
Breads, cereals, and other grain products	6 to 11 servings (include several servings a day of whole-grain products)
<ul style="list-style-type: none"> • Whole-grain • Other 	
Fruits	2 to 4 servings
<ul style="list-style-type: none"> • Citrus, melon, berries • Other fruits 	
Vegetables	3 to 5 servings (include all types regularly; use dark green leafy vegetables and dry beans and peas several times a week.)
<ul style="list-style-type: none"> • Dark-green leafy • Dry beans and peas (legumes) • Deep-yellow • Starchy • Other 	
Meat, poultry, fish and alternates (Eggs, dry beans and peas, nuts and seeds)	2 to 3 servings - total 5 to 7 ounces lean
Milk, cheese and yogurt	2 servings (3 servings for teens and women who are breast-feeding; 4 servings for teens who are pregnant or breast-feeding.
Fats, sweets, and alcoholic beverages	Avoid too many fats and sweets. If you drink alcoholic beverages, do so in moderation.
Serving sizes should be adjusted to match calorie needs. Following these rules helps to ensure adequate daily nutrient intake.	

What about the number of servings? The amount of food you need depends on your age, sex, physical condition and how active you are. Almost everyone should have at least the minimum number of servings from each food group daily. Many women, older children and most teenagers and men need more. The top of the range is about right for an active man or teenage boy. Young children may not need as much food. They can have smaller servings from all groups except milk, which should total two servings per day. You can use the guide to help plan for the variety and amounts of foods your family needs each day.

More specifically, regarding the nutrients found in meat:

- The RDA for protein is 44g for women over age 19, 56g for men over age 15. (It varies for children by age.)
- The RDA for iron is 10mg for children up to age 10, for males age 19 and older, and for women over age 50. Males from age 11 to 18 need 12mg, and females between 11 and 50 need 15mg.

- The recommended level for sodium is from 1,100mg to 3,300mg per day.
- USDA Dietary Recommendations suggest no more than 30 to 35 percent of calories from fat in your total diet.

There are no labels giving information about the food eaten in restaurants, but there are menus, photographs and graphic illustrations, as well as verbal descriptions by employees. How accurate is this information?

The question of accurate representation of food purchased in restaurants, fast food establishments, cafeterias, or carry-outs is of growing concern to consumer groups, the food service industry and regulators.

Restaurants want to keep customers coming back for more. For that reason, a quiet word in the waiter's ear will often solve a food problem. If it doesn't, be sure the management knows you won't be returning for "seconds."

Remember, your best protection as a consumer is your intelligence. Familiarize yourself with menu language. Get to know the popular words restaurants use to improve the sound of menu items.

If you have questions about menu descriptions or preparation techniques, be sure to ask when ordering to avoid being disappointed when the food arrives.

Economic Considerations

The relatively low cost of fast food is one of its prime attractions. One survey found the average price of a fast food meal was \$2.85, compared to \$6.92 in a conventional restaurant. Many consumers believe that a meal in a fast food restaurant costs the same or less than the same meal prepared at home. Fast food is actually more expensive, if no value is given to your time and labor in preparing it. Fast food hamburgers and cheeseburgers cost 25 to 33 percent more than homemade items, and pizza costs twice as much. An entire fast food meal, including entree, fries, soft drink or shake and dessert, will usually cost twice as much as the same meal prepared at home.

The learning experience of time and cost comparison ("Is It Worth the Difference?") will help consumers become aware of the difference in cost, and relate that to the time-saving. For many consumers, it may be worth the difference in cost to save the time, but you must know what that difference is before you can accurately answer the question, "Is It Worth the Difference?"

Leader Lesson Plan

Advance Preparation Guide

1. Review the Unit 3 teaching packet and handouts to be sure you understand the content and how to conduct each activity.
2. Order or reproduce Extension publications and have sufficient numbers of handouts for each participant.
3. For the activity "Compare One Day at Home or Away," obtain a copy of the USDA Handbook 8 Series, (Number 10, Pork Products, Number 13, Beef Products and Number 17, Lamb, Veal and Game). Home and Garden Bulletin Number 72, "Nutritive Value of Foods," is being revised and will be a more convenient reference when it is available. Until it is revised, however, the meat data are not up to date. You also can use the information in the National Live Stock and Meat Board's Nutrifacts, since it is based on the Handbook 8 Series. Check with your local Extension Service office for help in obtaining these publications.
4. Collect ingredient lists and nutrient analysis information from fast-food outlets and restaurants in your area to show as samples and for group discussion. Compile a list for group members of restaurants having information available.

Presentation Guide

Setting the Stage

To get the audience's interest:

Ask all the audience to stand up. Then tell those who have eaten in a restaurant that day to sit down. Then tell those who have eaten in a restaurant in the past week to sit down. Repeat for the past month, two months, and so on until everyone is sitting down. Note how recently the majority of the group have "eaten out."

Teaching Steps

HANDOUT: "Eating Out—Your Guide to Good Eating." Have participants complete the pre-test.

DISCUSS: The prevalence of eating out today. Be sure to include in your discussion:

- Who is using fast food, take-out and restaurant meats?
- Why they do so?
- What are the advantages and disadvantages?

HANDOUT: "Compare One Day—At Home or Away," and the fact sheets, "Eating Out: Your Guide to Good Eating." Have participants complete the form, using the chart in "Eating Out: Your Guide to Good Eating" to get the nutritional values.

DISTRIBUTE: A list of those restaurants in your area where nutrition information is available.

REVIEW: Nutrition and ingredient information available from local restaurants. Stress the importance for your group members to ask for information on food that affects their health.

HANDOUT: "Fast Food Meals: Cut the Fat and Sodium." Have the group describe other choices they could make to reduce the calories and sodium in the meals listed. If desired, the master can be duplicated so each individual participant can complete it.

HANDOUT: "Is It Worth the Difference?" Have participants complete it.

DISCUSS: "Time means money," but each person must decide for himself how much money he will spend to save time. Many consumers may not be aware of just how much they pay for the convenience of eating out. It may be well worth the difference in cost, but you must know what that difference is before you can accurately answer the question, "Is It Worth the Difference?"

SUMMARIZE: Briefly restate your main points. You might repeat the objectives from the beginning of the lesson, and describe the main points you taught that helped to meet each objective.

Handouts

- Eating Out: Your Guide to Good Eating–Pre-Post Test
- Compare One Day–At Home or Away?
- Fast Food Meals: Cut the Fat and Sodium
- Is It Worth the Difference?
- Fast Food and Restaurant Meats: Time Comparison Worksheet
- Fast Food and Restaurant Meats: Cost Comparison Worksheet
- Test Your Fast Food Savvy
- Eating Out: Your Guide to Good Eating–Fact Sheets

Eating Out: Your Guide to Good Eating

Unit 3, Pre-Post Test

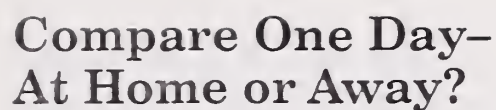
Circle true or false. If false, explain why.

1. T F Fast food and restaurant meals cost twice as much as the same food made from scratch.
2. T F Restaurants are required to have nutrition and ingredient information available to any customer who requests it.
3. T F The best way to make up for a high calorie meal in a restaurant is to skip breakfast the next day.
4. T F The protein and iron content of fast food and restaurant meats will be much lower than home-cooked.
5. T F The sodium and fat content of fast food and restaurant meats is usually much lower than home-made.
6. T F A salad bar selection is a good way to increase the amount of fiber in your meal.
7. T F Adding 1/4 cup of ranch dressing to your salad will add 100 calories.
8. T F To reduce the fat and sodium content of a hamburger, order it on a whole grain bun with lettuce and tomato, without cheese, mayonnaise or sauces.
9. T F Fast food menus can limit the variety of your diet if you eat them often.
10. T F In looking at the ingredient list of a restaurant food item, the ingredient that is listed first is the one present in the smallest amount.



Eating Out: Your Guide to Good Eating Key: Unit 3

1. T
2. F Restaurants are not required to have nutrition/ingredient information available.
3. F The best way to balance out a high-calorie meal is to plan lower calorie foods in other meals.
4. F The protein and iron content is about the same.
5. F The sodium and fat content is usually higher in fast food and restaurant meats.
6. T
7. F One-fourth cup of ranch dressing will add 320 calories to your salad.
8. T
9. T
10. F The **ingredient listed** first is present in the highest amount.



Type of restaurant	Meat entree	Calories	Fat (g)	Sodium (mg)	Protein (g)	Iron (mg)

- Could you prepare the same meats at home with less fat and sodium content?
- Do you make allowances in other meals for the fat and sodium content of these foods?
- Are the protein and iron content of the at-home and away-from-home meats about the same?

CONVENIENCE



Fast Food Meals: Cut the Fat and Sodium

In the chart below, list changes you could request in the way the foods are prepared or served, or different foods you could purchase, to reduce the calories, fat and sodium content of the meals. Consider also that some of the foods listed could fit into your diet just as they are.

Food Item	Calories	Fat (g)	Sodium (mg)	Optional food to reduce calories, fat or sodium
Arby's®				
Hot ham 'n' cheese	353	13.7	1,655	
Baked potato, superstuffed deluxe	648	38.0	475	
Hardee's®				
Big roast beef	440	21.5	1,434	
French fries	197	9.7	78	
Wendy's®				
Chili	240	8.0	990	
Frosty	400	14.0	220	

Note: Use of trade names is for educational purposes only and does not constitute an endorsement of any product to the exclusion of others.

Is It Worth the Difference?

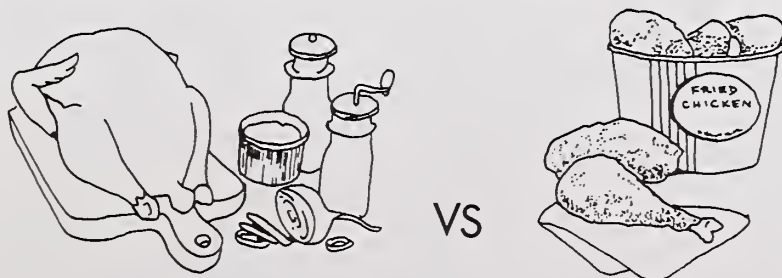
Meal Menu	Time		Cost	
	Restaurant	At Home	Restaurant	At Home
<ul style="list-style-type: none"> • Hamburger, 1/4 pound raw, 3 ounce cooked • Roll • French fries • Salad Bar – lettuce, shredded carrot, broccoli flowerettes, tomato • Milk, low-fat, 1 cup 				
Total				

- Compare the difference in cost.
- Compare the difference in time required.

Questions only you can answer:

For you, is the extra cost worth the time saved? _____

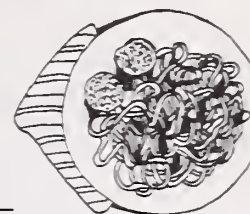
Is there someone in your family who is watching calories, sodium or fat in his/her diet? If so, can you control these factors in away-from-home foods? _____



CONVENIENCE



Fast Food and Restaurant Meats: Time Comparison Worksheet



Item _____

Restaurant Meat

Active preparation time _____

Cooking time _____

Clean-up time _____

Home Prepared Meat

Active preparation time _____

(You may want to list by ingredients or by stages,
such as browning meat, boiling spaghetti.)

Cooking time _____

Clean-up time _____

Comparison

Convenience Form

Home Prepared Form

Preparation time

Cooking time

Clean-up time

Active preparation time: Includes all steps that require the full or partial attention of the preparer, for example, reading directions, peeling, cutting, stirring, placing on and removing from range and placing in serving dishes. Does not include passive preparation time such as heating a product in the oven, since the preparer is free for other activities.

Cooking time: Time required for product to cook without attention (baking in oven).

Clean-up time: Replacing foods, washing and putting away cooking utensils, cleaning work areas and garbage disposal.

CONVENIENCE



Fast Food and Restaurant Meats: Cost Comparison Worksheet

Item _____

Restaurant Meat

Product purchased	Amount	Price	Unit price*	Quantity used***	Cost
_____	_____	_____	_____	_____	\$ _____
Ingredients added	Amount purchased				
_____	_____	\$ _____	\$ _____	_____	\$ _____
_____	_____	\$ _____	\$ _____	_____	\$ _____
Total					\$ _____
Number of servings _____				Cost per serving	\$ _____

Home Prepared Meat**

Ingredients	Amount purchased	Price	Unit price*	Quantity used***	Cost
_____	_____	\$ _____	\$ _____	_____	\$ _____
_____	_____	\$ _____	\$ _____	_____	\$ _____
_____	_____	\$ _____	\$ _____	_____	\$ _____
_____	_____	\$ _____	\$ _____	_____	\$ _____
_____	_____	\$ _____	\$ _____	_____	\$ _____
_____	_____	\$ _____	\$ _____	_____	\$ _____
Total					\$ _____
Number of servings _____				Cost per serving	\$ _____

*Unit Price is the price per package divided by the number of units.

** Use some ingenuity in adapting recipes to make the home prepared food as similar as possible to the convenience food.

*** For some items, you may have to calculate the amount of food in a serving or the amount of unprocessed food which will yield a serving. (Fuel costs, equipment cost and the value of the homemaker's time not included.)

CONVENIENCE

Test Your Fast Food Savvy

Which has the highest calorie count per serving?

1. a) Jack in the Box® Canadian Crescent
b) Wendy's® single Hamburger on a white bun
2. a) McDonald's® Big Mac
b) Burger King® Double Beef Whopper with cheese
3. a) Dairy Queen® Chicken Sandwich
b) Hardee's® Quarter-Pound Cheeseburger



Which contains the most grams of fat per serving?

4. a) Arby's® Regular Roast Beef Sandwich
b) Arby's® Chicken Breast Sandwich
5. a) Jack in the Box® Pasta Seafood Salad
b) Jack in the Box® Super Taco

Which has the highest salt content in mg per serving?

6. a) Long John Silver's® Seafood Platter
b) Burger King® Bacon Double Cheeseburger

Which has the most mg cholesterol per serving?

7. a) Whataburger® Whatachick'n Sandwich
b) Whataburger® with cheese



- Answers**
1. Canadian Crescent, 472;
single Hamburger, 350
 2. Big Mac, 570;
Double Beef Whopper, 950
 3. Chicken Sandwich, 670;
Cheeseburger, 506
 4. Roast Beef Sandwich, 15;
Chicken Breast Sandwich, 27
 5. Pasta Seafood Salad, 22;
Super Taco, 17
 6. Seafood Platter, 2,161;
Bacon Double Cheeseburger, 728
 7. Whatachick'n Sandwich, 71;
Whataburger with cheese, 96

Eating Out: Your Guide to Good Eating- Fact Sheets

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A Growing Appetite for Eating Out

Twenty years or so ago, eating out was still thought of by most families as a splurge, or celebration for special occasions: birthdays, anniversaries, graduations.

Today, Americans eat more than a third of their meals and snacks away from home and spend nearly half of every food dollar at restaurants. "Let someone else do the cooking" seems to be the battle cry of people short on time who value convenience more than money.

When consumers dine out, as they're doing more than ever before, they're not leaving their taste for a healthy diet at home. So more and more restaurants are changing their menus to satisfy their calorie-counting, nutrition-conscious clientele.

There are more than 700,000 places to eat out, ranging from hot dog vendors at ball parks and roadside stands to traditional gourmet restaurants who now cater to their health-conscious diners. We are spending close to \$200 billion for restaurant food. The National Restaurant Association estimates that more than 45 billion meals are eaten out annually and that the average person eats out about 192 times a year.



Fast Food Industry Booming

Every day millions of Americans flock to a wide array of fast food restaurants to devour hamburgers, cheeseburgers, hot dogs, pizza, beef roast, chili, tacos, burritos, barbecue ribs, french fries, onion rings, shakes, soft drinks and a host of other foods.

The fast food industry is finding new ways to prepare and serve food quickly and efficiently so that diners can eat heartily without a great investment of time and money. Choices are widening and consumption increasing.

In 1984 it was estimated that 200 customers ordered one or more hamburgers every second. Recently pizza has moved up as a favorite equal to the hamburger.

Even convenience stores and gas stations are introducing fast foods and limited menu items such as prepared meat sandwiches and microwaveable meat dishes, many with sit-down arrangements. Neighborhood grocery stores are offering expanded deli and ready-to-eat entrees along with in-store salad bars and hot soup.

Who's Eating Out? How Often? Why?

The popularity of fast food is well documented. Most people eat between one and three fast meals a week and this is increasing.

In many families, husbands and children no longer expect their wife or mother to be responsible for shopping and cooking, and conflicting schedules often make it difficult to plan family meals. Fast food is seen as a convenient alternative in these situations. Many factors have boosted the popularity of restaurant dining and fast food in particular, including an increase in the number of people living alone and lacking the desire or skills to cook for

themselves, preference for less formal lifestyles, increased disposable income, leisure time and travel, heavy advertising and foods which suit the palate of many.

At the present time, most consumers regard taste, price and convenience as more important factors when choosing a fast food place. Several trends suggest that consumers are increasingly sensitive to the nutritional quality of food including fast food menu items.

When Eating Out: What to Watch Out For

Many of us are attracted by the convenience, cost or the consistent quality and taste of fast food and want to make it a part of a nutritious diet. With thoughtful planning and being selective you can enjoy fast food and meet your essential nutrient needs without exceeding prudent intake of calories, fat and sodium. The secret is to choose your food wisely both at fast food restaurants and at home.

Fast food menus offer more choices today, including lighter, leaner selections for those who can't afford extra calories and fat. At most restaurants you'll find smaller burgers and entrees for light appetites as well as the choice preparation methods—broiling, baking and grilling meats—instead of frying, which can multiply calories and increase fat content.

In recent years most large fast food chains have analyzed the nutrient content of their food offerings. Evaluations of these offerings by nutrition and diet experts indicate that fast foods often are good sources of protein; and some items if selected would provide 20 to 30 percent of recommended allowances of thiamin (B_1), riboflavin (B_2), vitamin C, calcium and iron. A beef patty or roast beef sandwich will boost substantially the iron contribution. Making wise choices will help you get your essential nutrients without going overboard on calories, fat or sodium.

These are some general nutrition tips on some of the popular fast food items.

- The ever-popular **hamburger** is a good source of protein, iron, zinc, B_{12} , niacin and riboflavin. Even the smallest burger on the menu provides almost one third of your daily protein needs. And served on a roll made from enriched or whole wheat flour, vitamins and minerals are increased along with dietary fiber and complex carbohydrates.

- Calories increase with the number of "extras" (such as bacon, cheese and sauces) and the size of your selection. Regular burgers average less than 300 calories, medium-size burgers 400 to 500 calories and large burgers, 500 to 1,000 calories. Extras, such as cheese slices or special sauces, send the calorie count up. Cheese adds some vitamin A and calcium as well as 60 to 100 calories.
- A plain roast beef sandwich with no sauce carries fewer calories than the big hamburgers—sometimes 250 fewer—with as much protein and iron, but only a fraction of the fat. Even with a little barbecue sauce, a roast beef sandwich still ranks high above most entrees on leanness. By adding tomatoes and lettuce you can add vitamin C and dietary fiber.
- A ham and cheese sandwich is a good source of high quality protein, calcium and provides more than 50 percent of the recommended level of thiamin (B_1). Calorie content ranges between 400 and 500.
- Mexican food is among the most popular alternatives that provide a variety of nutrients and is moderate in calories. Corn tortillas are a source of fiber and calcium while chili and tomatoes give you vitamins A and C. Beef and beans provide protein, B vitamins, iron and other minerals. Tacos, enchiladas, tostadas and burritos are good bets (as long as the tortillas are not fried). These are made with nutritious and "lean" ingredients such as beef, beans, lettuce and tomatoes. Most regular-size tacos and tostadas have 200 to 300 calories. Enchiladas and burritos range from 350 to 450 calories.
- Fish and chicken are considered lean, low-calorie sources of high-quality protein, B vitamins and some minerals. The coating and deep-frying at fast-food restaurants, however, boost the fat and calorie content. Fried fish and chicken sandwiches have 400 to 600 calories. Tartar sauce adds another 75 calories per tablespoon.
- Fried chicken ranges from 200 to over 300 calories per piece, depending on the size and type of coating. Small chicken "bits" have approximately 55 calories each. Complete dinners range from 700 to over 1,000 calories.

- A convenient **fast-food breakfast** can keep you from skipping breakfast altogether. Be careful not to go overboard on calories. If you take in more than a third of your daily calorie needs before 9 a.m., you may end up with a surplus before the day is over. Don't forget nutritious breakfast items such as low-fat milk and juice.
- **Breakfast sandwiches** range from about 300 to 600 calories. Watch for high-fat or high-calorie extras. A pork sausage patty adds more than 200 calories while bacon adds about 35 to 55 calories per slice. A ham biscuit has only 300 calories, but is higher in sodium.
- If you enjoy a **hearty breakfast**, you may want to turn it into brunch.

Can Fast Food Be Part of a Healthy Diet?

Survey results suggest that even at a limited menu restaurant, substantial amounts of many nutrients are readily available. Consumers who vary their fast food choices can obtain a significant portion of their daily nutrient needs from fast food meals.

Since many fast food items are quite high in calories and sodium, individuals on restricted diets should plan their fast food choices carefully.

Cut the Calories

Consumers who need to restrict calorie intake should become familiar with the calorie counts of their favorite fast food items. With such knowledge in hand, fast food can even be incorporated into a weight-reduction diet. The calorie count of fast food meals varies according to the size and number of items chosen. A meal of a hamburger (with roll, as served) and a diet soft drink provides only 270 calories; a meal of a quarter-pound hamburger, fries and shake provides more than 1,000 calories.

Now that you know some facts about fast food, here are some tips to help tailor your food selections to meet your nutritional needs.

- Order the smallest size burrito, burger or sandwich. Avoid the biggies...anything that sounds colossal, super or gargantuan. They can multiply your calories.

- Skip the complete dinner and order a la carte. Pair it with a fresh green salad and low-calorie beverage.
- When possible, remove the skin and coating from deep-fried foods. This saves about 100 calories. Better yet, skip fried foods altogether.
- Order your sandwiches without mayonnaise, tartar sauce and other creamy dressings. They add up to 80 calories per tablespoon. Skip the cheese and save 83 calories and trim the sodium.
- Order a thin-crust pizza. Add extra mushrooms, tomatoes, peppers and onions.

Decrease Sodium

Most fast food items are high in sodium but you can chip away at the salt block. The recommended "safe and adequate range" of sodium for healthy adults is only 1,100 to 3,300mg daily. If sodium is a concern in your diet, try these tips.

- Reduce the amount of or avoid condiments altogether such as pickles, catsup and mustard which contain substantial amounts of sodium. Consumers who add salt to fast food items before eating further increase the food's sodium content.
- Order food cooked to order, without seasoning. This can decrease the sodium in french fries from more than 100 to approximately 25mg. A burger cooked without seasoning and served without condiment sauces, pickles, catsup and mustard can save you up to 360mg of sodium.
- Remove the highly seasoned coating from fried foods. This saves calories, too. People on very low-sodium diets can have trouble staying below 1,000 or 2,000mg of sodium daily. If you do have a high-sodium fast-food meal, balance the rest of your day with low-sodium selections. Try making your own version of a favorite fast food at home using low-sodium ingredients and seasonings.

Selected Foods to Balance Your Fast-food Diet

Fast-food meals contribute 50 to 100 percent of the protein and 30 to 60 percent of the iron and calcium needed by young adults, but the vitamin A and C in most meals is "very low." Fiber content is not shown for many meals. To keep from short-changing yourself on nutrients, include a variety of lean foods that are rich in the hard-to-get nutrients when you dine at home.

- Vitamin C—Citrus fruits and juices, strawberries, cantaloupe, kiwi, tomatoes, broccoli, green vegetables and chili peppers.
- Vitamin A—Liver, kidney, egg yolk, yellow and leafy green vegetables, sweet potatoes, apricots, cantaloupe, milk and cheese.
- Iron—Lean meat, fish and poultry, clams, oysters, dried beans, enriched breads and cereals, dried apricots and raisins. Include a vitamin C source with iron-rich foods to enhance iron absorption.
- Calcium—Low-fat milk and yogurt, cheese, sardines, broccoli, kale, turnip greens and collard greens, tofu (bean curd) and corn tortillas.
- Fiber—Meat and dairy products do not contain fiber. To increase the fiber in your diet, include a variety of whole-grain breads and cereals, fresh fruits and vegetables, nuts and seeds.

See the table at the end of this fact sheet for a nutrient analysis of selected fast foods.

Cheaper Than Eating at Home?

The reasonable cost of fast food is one of the prime attractions, and is frequently compared to the conventional sit-down restaurants. Nationally the average fast food meal is less than half the price of the same meal in a conventional restaurant, but more than the home-prepared.

Fast food is actually more expensive than its home-prepared counterpart, if no value is set on domestic labor and overhead costs. Fast food hamburgers and cheeseburgers cost 25 to 33 percent more than homemade items, and pizza costs twice as much. An entire fast food meal, including entree, fries, soft drink or shake and

dessert, will usually cost twice as much as the same meal prepared at home.

It is possible to find the most economical buy, the most nutrition and tasty food at restaurants just as it is possible to do so in the grocery store. In either case the consumer must know some basic nutrition and pricing rules.

The Conventional Restaurant

Today the old question of "What's for dinner?" is being replaced with "Where shall we eat?"

Restaurants offering ethnic cuisine are expanding and there is a revival of grand dining in hotels across the United States. Still, American cooking leads all other types of cuisine by a wide margin. Far behind comes ethnic Italian food, Chinese, Mexican, French and Japanese. When it comes to the main dish, most people report ordering meat, with steaks heading the list, followed by roast beef, pork and ham, veal and lamb.

The trend toward more healthful meals can be seen in local neighborhood restaurants, company cafeterias and upscale gourmet establishments.

Many full-service restaurants are offering lighter dishes emphasizing freshness, quality, regional cooking and seasonal foods. Compared to fast food places, they enjoy greater flexibility to adapt menus and preparation methods quickly to meet changing consumer preferences. Indeed, restaurant owners have become sufficiently aware of nutrition conscious clientele that the National Restaurant Association has published a guide for incorporating healthful food into recipes and menus.

To respond to the demand for lean meat and food prepared without sauces, butter and salt, some restaurants will alter the way they prepare food at the diner's request, and almost all will serve sauces and salad dressings on the side or cook without salt. Four out of five restaurants will broil or bake food instead of frying and three out of five will remove visible fat before cooking. Family restaurants designated as "meat and potato haven" are now broiling, roasting, grilling and baking a large portion of their entrees.

A growing number of restaurants are actively promoting nutritious or low-calorie fare. Some highlight nutritious items on the menu or

even have a separate menu for health-conscious diners. At other restaurants, the waiters and waitresses tell their customers about especially healthful menu items.

There is a rapid decline in restaurants that specialize in American plate meals and employ trained cooks, waitresses and waiters. The cost of labor has climbed steeply and skilled cooks are reportedly hard to find. Convenience foods, frozen prepared, partially precooked and fabricated for restaurant use, offer restaurants accurate portion control, no waste, time-saving efficiency and reduced need for trained manpower. Advances in technology produce more sophisticated convenience foods tailor-made for foodservice industry use. Gourmet specialties such as surf and turf (lobster and steak), Beef Stroganoff, glazed pork chops, veal parmigiana and stuffed cabbage that need only be heated quickly in a microwave oven are no exception to the elite restaurant menu.

Ethnic cuisine can make a healthful and relatively inexpensive dinner choice. More and more French chefs are preparing "Cuisine minceur," which translates into cuisine of slimness. This involves such techniques as poaching and cooking in fat-free liquids like vegetable juice and wine. Those who wish to limit fat and calories should try dishes this way rather than covered with heavy rich sauces such as hollandaise and bearnaise.

Asian meat combination dishes such as Japanese, Chinese or Thai are almost always comparatively low in fat. Stir-fry dishes with beef, pork or lamb and a mixture of fresh vegetables served over rice provide protein, minerals, vitamins and fiber, with little fat. Stir-fry dishes usually are prepared one serving at a time, so restaurants honor requests with a choice of fresh vegetables, with less salt, oil or soy sauce. This is a better choice than breaded chicken or spare ribs doused in sweet and sour sauce or fried egg rolls.

Italian food, although perceived as high calorie and high fat, can fit into a healthful diet—pasta with a tomato based meat sauce makes a low-fat, high protein choice. If you are concerned about calories or high fat, pasta loaded with a heavy cream base does not make a wise choice.

Just How Nutritious and Healthy Is Restaurant Food?

More than it used to be, it is possible to eat healthfully at restaurants, just as it is possible

to do so at home. In either case, the consumer must know some basic nutrition rules and apply them.

No one food is perfectly balanced. The aim is to eat a well-balanced diet, meal by meal, day by day. A healthful diet should include a variety of foods chosen from the Daily Food Guide and eaten in quantities appropriate to the individual's energy (calorie) needs.

One way to evaluate a food's nutritional value is to consider what comes along with its calories. Does the food have a high per calorie count for the desirable nutrients such as protein, vitamins, and minerals? Do the calories carry excess baggage, such as too much sodium and fat? Are they empty calories, providing food energy but carrying no nutrients at all?

Eating Out: Truth In Menus

No labels exist giving information about the food eaten in restaurants, but there are menus, photographs and graphic illustrations, as well as verbal descriptions by employees. How accurate is this information?

The question of accurate representation of food purchased in restaurants, fast food establishments, cafeterias, or carry-outs is of growing concern to consumer groups, the food service industry and regulators.

Menu Terms and Accuracy

Several states have passed "truth in menu" legislation; however, there are no federal laws requiring menu accuracy.

Truthful representation of foods includes accuracy in the following categories:

- **Quantity:** Steaks and burgers sold by weight should be the weight listed before cooking.
- **Quality:** If terms such as Grade A, Choice, Fancy, Grade AA, Prime, etc., are used, they imply quality grades as established by federal or state standards. "Choice sirloin of beef" connotes USDA Choice Grade Sirloin of Beef. "Prime" beef is an exception since it has a long history of use and designates a cut from the primal ribs, not a grade, unless used with the term USDA.

- **Points of Origin:** Origin of food product listed should be the actual source of the product:

- Virginia ham
- Romanian pastrami
- Smithfield ham

On the other hand, geographic names may be used generally to describe a method of preparation or service:

- Brunswick stew
- French dip
- London broil
- Swiss steak

- **Merchandising Terms:** Menu terms sometimes exaggerate, but they should not mislead. Read with caution the terms:

- Kosher meat
- Aged steaks
- Homemade stews or soups ("homestyle" or "our own" are preferred)

- **Means of Preservation:** If terms to describe method of preservation are used, they must be accurate:

Canned stews are not freshly made

- **Food Preparation:** Many consumers make a final selection based on method of preparation. Commonly used terms include:

- Charcoal broiled
- Baked
- Barbecued
- Roasted
- Deep fried
- Smoked
- Poached

- **Price:** Restrictions on use of coupons, inclusion of tips or cover charges or charges for extra plates for small children should be clear when ordering.
- **Brand Names:** If a particular product is advertised, it should be the one served. Brand names should not be used generically. If sauces or condiments are served in a container with the brand name on it, the contents should be the same product.

- **Product Identification:** If certain products are listed, they should be used rather than a common substitution. Some common substitutions are:

- Ground beef or ground beef with protein
- Extenders for chopped ground sirloin
- Veal patties or steaks for veal cutlets
- Beef liver for calves liver

- **Verbal and Visual Presentation:** menu and wall pictures must reflect the actual food product offered for sale. If a picture has three thick slices of meat, two thin slices or small chunks would not be served.

- **Nutritional Claims:** "salt free" or "sugar free" must be just that. "Low calorie" claims should be supported by specific data.

What Can You Do?

If you order a chopped sirloin steak and get a mystery meat, what can you do about it? Send it back (politely)? Drown it with catsup? Do battle over the restaurant table? Or, call it a day?

Restaurants want to keep customers coming back for more. For that reason, a quiet word in the waiter's ear will often solve a food problem. If it doesn't, be sure the management knows you won't be returning for "seconds."

More and more state and local governments, in cooperation with the food service industry, have begun to do something about truth in menus. If you run into a restaurant where you can't seem to get what you paid for, contact your local consumer affairs office, the Chamber of Commerce, the State Department of Consumer Affairs or a local elected official. Find out if your area has a "diner's protection" law. If it doesn't, ask why. Your complaint may help start things rolling.

Remember, your best protection as a consumer is your intelligence. Familiarize yourself with menu language. Get to know the popular words restaurants use to improve the sound of menu items.

Daily Food Guide	Servings Per Day
Bread, Cereal, Grain	6 to 11
(Include several whole-grain products each day.)	
Fruits	2 to 4
(Citrus, melon, berries other fruits)	
Vegetables	3 to 5
(Use dark green leafy vegetables and dry beans and peas several times a week.)	
Meat Poultry, Fish and Alternates	2 to 3 servings (5 to 7 ounces lean)
Milk, Cheese, Yogurt	2 servings (3 servings for teens and women who are pregnant or breast-feeding; 4 servings for teens who are pregnant or breast-feeding)

The amount you need depends on your age, sex, level of activity and physical condition.

If you have questions about menu descriptions or preparation techniques, be sure to ask when ordering to avoid being disappointed when the food arrives.

Let management know if you would like foods offered that are not currently on the menu such as skim milk, fresh fruit and whole wheat buns. Also, remember that some desired items might result in higher prices.

Dining Out Doesn't Have to Be a Dietary Dilemma

WHAT TO DO? Don't let your best dietary intentions crumble while enjoying a meal at the company cafeteria, local restaurant or gourmet establishment. Keep the following tips in mind:

Healthful dining starts with selecting the right restaurant. If possible, scan the menu first to see how foods are prepared. Foods that are "made to order" make it easier to request

items prepared without fat and with sauces/dressings served on the side. Restaurants that offer a la carte selections provide a better alternative than all-you-can-eat feasts.

- Plan ahead. Don't go starved to the restaurant or cafeteria. If you're famished when you order, it's easier to overeat.
- Order a la carte meals. Ordering a full meal just because the cost is less can cause you to order more food than you need.
- Watch for the hidden calories. If you're trying to cut down on fat and calories in your diet, dining out doesn't have to spell disaster. Before ordering, ask how the food is prepared. Guesswork can produce extra calories and fat added by frying, breading, rich sauces, dressings and oils. Since most high-fat sauces are added at the end of cooking, request they be left off or served on the side.

Don't be shy about asking the waiter to have the food prepared the way you like. The worst that can happen is that he will say it's not possible.

A number of people are now grazing, that is, eating small amounts of food four to six times a day rather than meals three times a day. The idea is catching on, and restaurants offer mini-meals such as combination of appetizers and soup. Another trend is to order appetizers and then split a sandwich or an entree.

Regardless of whether you grab a fast-food meal, graze or sit down to a full course dinner, there's no doubt that your choices for nutritious food are getting better.



Nutrient Data For Selected Fast Foods

	Calories	Protein		% Calories from Fat	Carbo- hydrate (gm)	Sodium (mg)	Choles- terol (mg)	% U.S.RDA					
		(gm)	Fat (gm)					Protein	Vitamin A		Vitamin C	Calcium	Iron
HAMBURGERS													
McDonald's*													
Hamburger	255	12	10	35	30	520	24	25	2	3	5	12	
• Cheeseburger	307	15	14	41	30	767	37	35	7	3	13	13	
• Big Mac	563	26	33	53	41	1010	86	60	11	4	16	22	
• Quarter Pounder	424	24	22	47	33	735	67	55	3	*	6	23	
• Quarter Pounder w/cheese	524	30	31	53	32	1236	96	65	13	4	22	24	
Burger Chef*													
• Hamburger	244	12	13	48	24	393	32	25	2	2	6	10	
• Cheeseburger	290	14	17	53	24	535	44	30	6	2	15	10	
• Big Chef	569	23	34	54	35	622	74	50	6	2	20	20	
Jack in the Box*													
• Hamburger	263	13	11	38	29	565	26	30	*	2	8	15	
• Cheeseburger	310	16	15	44	28	875	32	35	6	*	15	15	
• Jumbo Jack													
• Hamburger	551	28	20	33	45	1135	80	60	4	6	15	25	
Wendy's*													
• Single	470	26	26	50	34	774	70	60	*	*	8	25	
• Double	670	44	40	54	34	980	125	100	2	2	10	45	
• Triple	850	65	51	54	33	1217	205	145	4	2	10	50	
(The Wendy's hamburgers which were tested were ordered with lettuce, catsup, tomatoes, onions, pickles, mustard and mayonnaise.)													
Burger King*													
• Hamburger	290	15	13	40	29	525	NA	35	*	*	*	15	
• Cheeseburger	350	18	17	44	30	730	NA	40	*	*	4	15	
• Whopper	630	26	36	51	50	990	NA	60	*	*	4	15	
• Whopper w/cheese	740	32	45	55	52	1435	NA	70	*	*	15	15	
• Whopper Jr.	370	15	20	49	31	560	NA	35	*	*	*	10	
• Whopper Jr. w/cheese	420	18	25	54	32	785	NA	40	*	*	8	10	
(Burger King Corporation suggests that to reduce calorie levels of a Whopper by about 153, or of a Whopper Jr. by about 51, order the sandwich without mayonnaise. To reduce the sodium level of a hamburger or cheeseburger by about 93 mg, a Whopper by about 186 mg, or a Whopper Jr. by about 93 mg, order the sandwich without pickles.)													
FISH													
Long John Silver's*													
• Fish w/Batter (2 pieces)	366	22	22	54	21	NA	NA	50	NA	NA	NA	NA	
• Shrimp w/Batter (6 pieces)	268	8	13	44	30	NA	NA	20	NA	NA	NA	NA	
• Breaded Clams	617	18	34	50	61	NA	NA	40	NA	NA	NA	NA	
McDonald's*													
• Filet-O-Fish	432	14	25	52	37	781	47	30	4	*	9	10	
CHICKEN													
Kentucky Fried Chicken*													
• Original Recipe (2 pieces)	393	28	26	60	11	868	164	60	*	*	6	12	
• Original Recipe Dinner	661	33	38	52	48	1536	172	75	5	61	13	21	
• Extra Crispy (2 pieces)	544	32	37	61	21	861	168	70	*	*	6	12	
• Extra Crispy Dinner	902	36	48	48	58	1529	176	80	5	61	14	36	
(Dinners include 2 pieces chicken, mashed potatoes, gravy, cole slaw and roll. Nutritional values for fried chicken will vary for different chicken parts, and for pieces of different sizes. These figures are based on a typical combination of 1 wing and 1 thigh.)													
McDonald's*													
• Chicken McNuggets (no sauce)	314	20	19	54	15	525	76	45	*	*	1	6	

	Calories	Protein (gm)	Fat (gm)	% Calories from Fat	Carbo- hydrate (gm)	Sodium (mg)	Choles- terol (mg)	Protein	% U.S.RDA			
									Vitamin A	Vitamin C	Calcium	Iron
ROAST BEEF												
Arby's*												
• Regular Roast Beef	353	22	15	38	32	345	20	20	*	*	4	10
Hardee's*												
• Roast Beef Sandwich	312	20	12	35	30	966	68	31	NA	NA	1	35
Roy Rogers*												
• Roast Beef Sandwich	317	27	10	28	29	785	55	60	2	*	9	23
PORK												
Arby's*												
• Hot Ham'n'Cheese	353	26	13	33	33	1655	50	NA	4	40	20	10
Hardee's*												
• Hot Dog	285	12	14	44	27	796	40	18	NA	NA	3	27
• Sausage Biscuit	426	14	28	59	29	831	25	21	NA	NA	19	34
• Hot Ham'n'Cheese	316	24	10	28	34	1833	57	36	NA	NA	17	26
McDonald's*												
• Biscuit w/Sausage	440	13	29	60	32	1080	49	20	0	0	8	10
PIZZA												
Pizza Hut II*												
• Standard Cheese (1/2 13" medium, Thin 'N Crispy)												
	680	38	22	29	84	1800	NA	80	24	*	100	40
• Supreme (1/2 13" medium, Thin 'N Crispy)												
	800	42	34	38	88	2400	NA	90	30	8	80	50
Domino's Pizza*												
• 12" Cheese Pizza, 2 slices												
	340	18	6	16	52	660	10	NA	4	0	30	20
• 16" Pepperoni Pizza, 2 slices												
	440	24	14	29	56	1080	60	NA	4	0	40	20
MEXICAN-STYLE FOODS												
Taco Bell*												
• Bean burrito	343	11	12	31	48	272	NA	15	33	25	10	16
• Beef burrito	466	30	21	41	37	327	NA	45	34	25	8	26
• Burrito Supreme	457	21	22	43	43	367	NA	30	69	27	12	21
• Tostada	179	9	6	30	25	101	NA	15	63	16	19	13
• Taco	186	15	8	39	14	79	NA	25	*	2	12	14
Wendy's*												
• Chili	230	19	8	31	21	1065	25	40	20	4	8	20
Jack in the Box*												
• Regular Taco	190	8	11	52	15	460	20	20	6	*	10	6
• Super Taco	280	12	17	51	20	970	35	25	10	2	20	10

*less than 2 percent

NA - Data not available

Sources: "Fast Food and the American Diet." A Report by the American Council on Science and Health, April 1983.

"Nutrition - What's In It for You?" Nutritional Analysis by Hardee's Food Systems, Inc., 1988.

"Guide to Good Eating at Roy Rogers." Nutritional Analysis by Marriott Corp., 1985.

"Arby's. The Right Choice." Nutritional Analysis by Arby's Inc., 1987.

Note: The use of tradenames in this publication is solely for the purpose of providing specific information. This does not constitute a guarantee, warranty, or endorsement of the products named and does not signify approval to the exclusion of others.

Suggested Learning Experiences

1. Handout (master included): "Compare One Day-At Home or Away" to determine the difference or similarity in selected nutrients between meats eaten at home or away from home.
2. Handout (master included): "Fast Food Meals-Cut the Fat and Sodium" to consider fat and sodium content of selected fast food meals and options to reduce.
3. Handout (master included): "Is It Worth the Difference?" to help participants determine the price they pay for convenience.
4. Handouts (masters included): "Time Comparison Worksheet" and "Cost Comparison Worksheet" for participants to determine differences in cost and preparation time for home-prepared and restaurant meat foods.
5. Have participants conduct a survey of restaurant meat foods available, comparing factors such as price, ease of preparation and nutrient content.
6. Take an informal survey of the group on restaurant food use. What are the most popular items? Discuss ways in which these items can be incorporated into a healthy balanced diet.
7. Divide the participants into groups. Have each group evaluate one type of restaurant meat, using the "Cost Comparison Worksheet" and the "Time Comparison Worksheet." The group should discuss if the extra cost is worth the convenience.
8. Encourage participants to keep track for one month of how much they spend for foods eaten away from home. The amount may surprise them. Discuss some ways to cut down on away-from-home foods, and ways family members can help to prepare some of the foods at home.
9. Have participants complete "Test Your Fast Food Savvy" quiz (master included). It also could be used as a pre and post-test before and after the lesson.
10. Guest appearance on local television or radio talk show. Prepare questions and answers ahead of time.
11. Series of newspaper articles on eating out; could be submitted to restaurant review column.
12. Poster/essay contest for school children on the place of meat/fast food in the diet.
13. Discussion panel with a restaurant owner/manager, a fast food restaurant owner/manager and a dietitian.

Supplementary Resource Materials

Dietetic Currents

- Young, E.A., Sims, O.L., Bingham, C., and Brennan, E.H. 1986. Fast foods 1986: nutrient analyses. *Dietetic Currents*. 13(6):25

FDA Consumer

- Anonymous. 1987. Dining out with a healthy appetite. *FDA Consumer*. 21(2):19.
- Lecos, C. 1983. What about nutrients in fast food? *FDA Consumer*. 17(4):10.

Restaurant Companies (ingredient and nutrition information)

- Arby's Inc., Consumer Affairs, Ten Piedmont Center, Suite 700, 3495 Piedmont Road, NE, Atlanta, GA 30305-1796
- Burger King Corporation, Consumer Information M/S 1441, P. O. Box 520783, Miami, FL 33152
- Hardee's Consumer Nutrition Dept., 1233 North Church Street, Rocky Mount, NC 27802-1619
- Jack in the Box, 9330 Balboa Avenue, San Diego, CA 92123

- Kentucky Fried Chicken, Consumer Affairs Department, P.O. Box 32007, Louisville, KY 40232
- (Long John Silver's), Jerrico, Inc., Food and Beverage Department, P. O. Box 11988, Lexington, KY 40579
- McDonald's Corporation, Consumer Affairs, McDonald's Plaza, Oak Brook, IL, 60521
- Pizza Hut, Inc., Consumer Affairs Department, P. O. Box 428, Wichita, KS 67201
- Roy Rogers Restaurants, Manager of Public Relations, Marriott Corp., Marriott Drive, Washington, DC 20058
- Wendy's International, Inc., Consumer Affairs Department, P.O. Box 256, Dublin, OH, 43017

USDA

- Human Nutrition Information Service, "Eating Better When Eating Out, Using the Dietary Guidelines," Home and Garden Bulletin No. 232-11.

Evaluation Instrument

Evaluation is a tool, not an end in itself. It is the means by which your program and methods can be assessed and made more effective. Evaluation helps you determine how much progress your clientele have made toward their educational objectives.

For concrete evidence of the effectiveness of your program, use one or two evaluation methods. Evaluation sheets and pre-post tests are included in the handouts for each unit.

When you evaluate systematically and objectively, you derive personal satisfaction from sure knowledge that your work has achieved success.

References

- American Council on Science and Health. 1983. "Fast Food and the American Diet," ACSH, Summit, NJ.
- Anonymous. 1987. Dining out with a healthy appetite. FDA Consumer. 21(2):19.
- Anonymous. 1987. Eating right when you're eating out—special report. Tufts University Diet and Nutrition Letter. 5(4):3.
- Anonymous. 1987. Fast food chains talk nutrition but how much do they reveal? Environmental Nutrition. 10(3).
- Bell, C. 1985. Fast tips for fast foods. Safeway Stores, Oakland, CA.
- Bishop, W. 1987. Consulting Economist. Telephone survey, Barrington, Illinois. Supermarket News. 3/87.
- Community Nutrition Institute. 1987. Study notes fast foods need nutrition labeling. Nutrition Week. 17(12):7.
- Economic Research Service. 1986. Food service. In "Food Marketing Review 1986," U.S. Dept. of Agriculture, Washington, DC.
- Economic Research Service. 1987. Foodservice trends. National Food Review Yearbook. NFR(37):10.
- Enns, C. and Guenther, P. 1988. Women's food and nutrient intake away from home. Family Economics Review. (1):9.
- Harris, L. 1987. "Inside America Eating Out: A Real Treat But Nutritional Nightmare," Vintage Books, New York, NY.
- Lecos, C. 1983. What about nutrients in fast food? FDA Consumer. 17(4):10.
- Putnam, J. and Van Dress, M. 1984. Changes ahead for eating out. National Food Review. NFR26:15.
- Young, E.A., Sims, O.L., Bingham, C., and Brennan, E.H. 1986. Fast foods 1986: nutrient analyses. Dietetic Currents. 13(6):25.

APPENDIX

A. List of Camera-Ready Copies of Handouts

1. MODULE I: The Livestock Industry: Production of Lean, Wholesome Meat for the Consumer

a. Unit 1. Move Toward Leanness in the Livestock Industry

- Evaluation Instrument
- Nutrient Profile of Beef, Pork and Lamb with Different Fat Cover Levels
- The Livestock Industry Move Toward Leanness Summary Sheets
- Lean Meat Seek and Find
- Myths About Lean Meat

b. Unit 2. Meat Safety and Wholesomeness

- Evaluation Instrument
- Hormones and Meat
- Estrogen Production in Humans and Estrogen Content of Foods
- Lines of Defense In Keeping Meat Safe
- Myths About Food Safety

2. MODULE II: Meat, Nutrition and Your Health

a. Unit 1. Meat Nutrition—Overview

- Evaluate Your Lean Meat Nutrition Knowledge
- Nutrition and Your Health: The Dietary Guidelines for Americans
- A Daily Food Guide for Variety and Balance
- What Is a Serving?
- Guide to 3-Ounce Cooked Serving Sizes
- Getting Two Servings of Meat in the Daily Diet
- Table 1. Nutritional Comparisons of Meats and Alternates
- Table 2. Selected Nutrients Provided by Animal Products
- Table 3. Healthy Body Weight Ranges For Adults
- Know Your Eating Habits
- What Did You Have to Eat Yesterday?

b. Unit 2. Meat Nutrition—Fats and Cholesterol in the Diet

- Evaluate Your Fat and Cholesterol Knowledge
- Fats in Diet Evaluation
- Comparison of National Dietary Guidelines of Health Organizations
- National Dietary Guidelines of Various Health Organizations
- Test Your Fat and Cholesterol IQ
- Specific Amounts of Fat, Cholesterol and Sodium in Lean Meats
- What Foods Contain Cholesterol?
- Cholesterol Content of Foods
- Be a Nutrition Whiz—Reduce Fat Content of the Daily Diet

c. Unit 3. Meat Nutrition—Sodium in the Diet

- Evaluate Your Sodium Sense
- Heart-Healthy Herb and Spice Blends
- Form for Rating Heart-Healthy Meat Patties

- Look For the Sodium In Fresh/Processed Meats
- The Sodium Count-Down
- Group Discussion Sheet–Clues for Avoiding Too Much Sodium When Selecting Lean Meats
- When in Doubt, Learn to Leave the Sodium Out!
- Sodium Free Seasonings for Meat
- Grocery Store Label Check Activity

3. MODULE III: Making Sen\$e of Meat Purchases

a. Unit 1. Meat Cut Identification and Evaluation

- Meat Cut Selection Knowledge
- Veal–Retail Cuts
- Beef–Retail Cuts
- Lamb–Retail Cuts
- Pork–Retail Cuts
- Primal Cuts of Veal, Lamb, Pork and Beef

b. Unit 2. Shopping for Lean Meat

- Meat Shopping: Pre-Post Test
- Check Out Your Meat Counter Choices
- Decision-tree for Meat Buying
- Servings of Meat Per Pound
- Meat Buying Aids
- A Buyer's Guide to Cost Per Serving of Meat
- Meat Cutting Yield Test and Price Comparison

4. MODULE IV: Preparation of Today's Lean Meat

a. Unit 1. Meat Cookery

- Evaluation Instrument
- Science Behind the Sizzle
- Dry Heat Methods
- Moist Heat Methods
- Methods of Meat Cookery
- Preparation of Medium Tender Meat Cuts
- Cooking Light, Cooking Lean
- Changing Recipes
- Microwave Cooking of Meats
- Outdoor Grilling
- Recommended Cooking Temperatures and Degrees of Doneness

b. Unit 2. Proper Handling and Storage

- Evaluation Instrument
- Home Kitchen Survey
- Temperature of Food for Control of Bacteria
- Recommended Storage Times for Fresh and Frozen Meats
- Wrapping Meat for the Freezer

5. MODULE V: Meat: A Convenience Bill of Fare

a. Unit 1. A New Generation of Convenience Entrees and Dinners

- A New Generation of Convenience Entrees and Dinners: Evaluation
- Safe From Store to Table: Pre-Post Test
- Safe From Store to Table: Fact Form
- Is It Worth the Difference? Convenient At-Home Meats
- A New Generation of Convenience Entrees and Dinners: Fact Sheets

b. Unit 2. Shopping a la Carte: Take-Out Meats

- Shopping a la Carte: Take-out Meats—Evaluation
- Cost of Take-out Eating
- A Nutrinomic Comparison of Protein Costs
- Shopping a la Carte: Take-out Meats—Fact Sheets

c. Unit 3. Eating Out: Your Guide to Good Eating

- Eating Out: Your Guide to Good Eating—Pre-Post Test
- Compare One Day—At Home or Away?
- Fast Food Meals: Cut the Fat and Sodium
- Is It Worth the Difference?
- Fast Food and Restaurant Meats: Time Comparison Worksheet
- Fast Food and Restaurant Meats: Cost Comparison Worksheet
- Test Your Fast Food Savvy
- Eating Out: Your Guide to Good Eating—Fact Sheets

B. Address List for Supplementary Materials

1. MODULE I: The Livestock Industry: Production of Lean, Wholesome Meat for the Consumer

a. Unit 1. Move Toward Leanness in the Livestock Industry

American Sheep Industry Association
200 South Clayton
Denver, CO 80206

National Cattlemen's Association
P. O. Box 3469
Englewood, CO 80155

National Live Stock and Meat Board
444 North Michigan Avenue
Chicago, IL 60611

b. Unit 2. Meat Safety and Wholesomeness

American Council on Science and Health
1995 Broadway
New York, NY 10023-5860

American Meat Institute
P. O. Box 3556
Washington, DC 20007

Food and Drug Administration
Washington, DC 20204

Food Safety and Inspection Service Publications Office
1165 South Building
USDA
Washington, DC 20250

National Cattlemen's Association
P. O. Box 3469
Englewood, CO 80155

U.S. Meat Export Federation
Cherry Creek Plaza I, Suite 1000
600 South Cherry
Denver, CO 80222-1716

2. MODULE II: Meat, Nutrition and Your Health

a. Unit 1. Meat Nutrition—Overview

American Dietetic Association
216 West Jackson Boulevard
Suite 800
Chicago, IL 60606-6995

American Heart Association
7320 Greenville Avenue
Dallas, TX 75231

American Meat Institute
P. O. Box 3556
Washington, DC 20007

Council for Agricultural Science and Technology
137 Lynn Avenue
Ames, IA 50010-7120

FDA Consumer
HFE-88
Rockville, MD 20857

National Live Stock and Meat Board
444 North Michigan Avenue
Chicago, IL 60611

U.S. Department of Agriculture
Consumer Information Center
Department EE
Pueblo, CO 81009

U.S. Department of Health and Human Services
Public Health Service
Food and Drug Administration
5600 Fishers Lane
Rockville, MD 20857

University of Wisconsin
Agricultural Publications
30 North Murray Street
Madison, WI 53706

b. Unit 2. Meat Nutrition—Fats and Cholesterol in the Diet

American Dietetic Association
216 West Jackson Boulevard
Chicago, IL 60606-6995

American Heart Association
7320 Greenville Avenue
Dallas, TX 75231

American Meat Institute
P. O. Box 3556
Washington, DC 20007
703/841-2400

FDA Consumer
HFE-88
Rockville, MD 20857

Iowa Beef Industry Council
P. O. Box 451
Ames, Iowa 50010

National Cattlemen's Association
P. O. Box 3469
Englewood, CO 80155

National Heart, Lung, and Blood Institute
of the National Institutes of Health
Information Center
4733 Bethesda Avenue
Suite 530
Bethesda, MD 20814

National Live Stock and Meat Board
444 North Michigan Avenue
Chicago, IL 60611

Texas Beef Industry Council
8310 Capital of Texas Highway North
Suite 440
Austin, TX 78731

U.S. Department of Agriculture
Consumer Information Center
Department EE
Pueblo, CO 81009

U.S. Department of Health and Human Services
Public Health Service
Food and Drug Administration
5600 Fishers Lane
Rockville, MD 20857

c. Unit 3. Meat Nutrition—Sodium in the Diet

Alfred Higgins Productions, Inc.
Los Angeles, CA

American Heart Association
7320 Greenville Avenue
Dallas, TX 75231

FDA Consumer
HFE-88
Rockville, MD 20857

National Health Systems
Ann Arbor, MI

National High Blood Pressure Education Program
120/80 National Institutes of Health
Bethesda, MD 20892

National Live Stock and Meat Board
444 North Michigan Avenue
Chicago, IL 60611

U.S. Department of Agriculture
Consumer Information Center
Department EE
Pueblo, CO 81009

U.S. Department of Health and Human Services
Public Health Service
Food & Drug Administration
5600 Fishers Lane
Rockville, MD 20857

3. MODULE III: Making Sense of Meat Purchases

a. Unit 1. Meat Cut Identification and Evaluation

NASCO
901 Jamesville Avenue
Fort Atkinson, WI 53538-0901

National Association of Meat Purveyors
8365-B Greensboro Drive
McLean, VA 22102-3585

National Live Stock and Meat Board
444 North Michigan Avenue
Chicago, IL 60611

b. Unit 2. Shopping for Lean Meat

American Meat Institute
P. O. Box 3556
Washington, DC 20007

David E. Schafer
Extension Meats Specialist
AS&I, Weber Hall
Kansas State University
Manhattan, KS 66506

OR
Your state EMS
through local
County Extension
Office

Food Marketing Institute
1750 "K" Street NW, Suite 700
Washington, DC 20006

National Live Stock and Meat Board
444 North Michigan Avenue
Chicago, IL 60611

U.S. Department of Agriculture
Consumer Information Center
Department EE
Pueblo, CO 81009

4. MODULE IV: Preparation of Today's Lean Meat

a. Unit 1. Meat Cookery

b. Unit 2. Proper Handling and Storage

American Lamb Council
200 Clayton Street
Denver, CO 80206

Barbecue Industry Association, The
710 East Odgen Avenue
Naperville, IL

National Live Stock and Meat Board
444 North Michigan Avenue
Chicago, IL 60611

National Pork Producers Council
P. O. Box 10383
Des Moines, IA 50306

United States Department of Agriculture
Food Safety and Inspection Service
Room 1165-5
Washington, DC 20250

5. MODULE V: Meat: A Convenience Bill of Fare

a. Unit 1. A New Generation of Convenience Entrees and Dinners

None available.

b. Unit 2. Shopping a la Carte: Take-Out Meats

None available.

c. Unit 3. Eating Out: Your Guide to Good Eating

Arby's, Inc.
Consumer Affairs
Ten Piedmont Center, Suite 700
3495 Piedmont Road, NE
Atlanta, GA 30305-1796

Burger King Corporation
Consumer Information M/S 1441
P. O. Box 520783
Miami, FL 33152

Dietetic Currents
Ross Laboratories
625 Cleveland Avenue
Columbus, OH 43216

FDA Consumer
HFE-88
Rockville, MD 20857

Hardee's Consumer Nutrition Department
1233 North Church Street
Rocky Mount, NC 27802-1619

Jack in the Box
9330 Balboa Avenue
San Diego, CA 92123

Jerico, Inc.
(Long John Silver's)
Food and Beverage Department
P. O. Box 11988
Lexington, KY 40579

Kentucky Fried Chicken
Consumer Affairs Department
P. O. Box 32070
Louisville, KY 40232

McDonald's Corporation
Consumer Affairs
McDonald's Plaza
Oak Brook, IL 60521

Pizza Hut, Inc.
Consumer Affairs Department
P. O. Box 428
Wichita, KS 67201

Roy Rogers Restaurants
Manager of Public Relations
Marriott Corporation
Marriott Drive
Washington, DC 2005

Wendy's International, Inc.
Consumer Affairs Department
P. O. Box 256
Dublin, OH 43017

C. Supplementary Resource Materials

1. MODULE I: The Livestock Industry: Production of Lean, Wholesome Meat for the Consumer

a. Unit 1. Move Toward Leanness in the Livestock Industry

American Sheep Industry Association

- Lean Lamb Marketing (video, 12 minutes)
(Shows changes going on in the lamb industry to produce a leaner product consumers.)

National Cattlemen's Association

- The Story of Modern Beef Handbook, 1987
- A Report Card on Beef (video, 8:30 minutes)
("Grades" the beef industry for 1970s, 1980s and 1990s in terms of the product it is providing for consumers; entertaining and informative about changes in the beef industry during the past decades)
- Today's Trimmer Beef (video, 6 minutes)
(Details results of the checkoff-funded Market Basket Survey which showed that retail beef cuts are now trimmed more closely; is ideal for showing food retailers, health professionals and other "influencers" how lean beef has become)

National Live Stock and Meat Board

- Announcing Some Findings on Cholesterol (brochure)
- A Change of Plate (chart and food models)
- Pork and Consumer Market
- Red Meat: Nutrient Composition and Actual Consumption
(slides, script and booklets)
- National Consumer Retail Beef Study (video)
- Exploring Meat and Health
- On the Trail of Hidden Fat
- A Guide to Heart-Healthy Eating
- Contribution of Red Meat to the U.S. Diet
- Myths About Beef
- Dietitians Quiz on Pork
- Facts about Beef

b. Unit 2. Meat Safety and Wholesomeness

American Council on Science and Health

- Does Nature Know Best? Natural Carcinogens in American Food

American Meat Institute

- The U.S. Meat Supply: Your Safety Assured
- What's in the Meat We Eat?

Food and Drug Administration

- Food and Drug Administration Pesticide Program, 1987
- Residues in Food—1987. J. Assoc. Official Anal. Chem. 71:Nov/Dec. 1988

Food Safety and Inspection Service Publications Office

- Meat and Poultry Inspection: FSIS Facts
- The National Residue Avoidance Program: FSIS Facts
- Food Additives: FSIS Facts
- The Safe Food Book—Your Kitchen Guide

National Cattlemen's Association

- The Story of Modern Beef Handbook, 1987
- Production of Modern Beef (video, 15 minutes)
(Explains what "modern beef" is and what it means to individual beef producers; for showing to groups of beef producers; ideal opening piece for a seminar or discussion on changes in the modern beef business)
- Story of Modern Beef (video, 10 minutes)
(Shows what the beef industry is doing to "trim the fat" and make beef a more desirable product for today's modern consumers; graphic examples of nutritional value of beef and how the saturated fatty acids in beef are not as bad as has been assumed; the video is for consumer thought leaders, consumers and beef producers)
- Producing Wholesome Beef (video, 15 minutes)
(Puts use of growth-promoting implants into perspective and shows that U.S. beef supply is safe and wholesome; shows that misconceptions about use and safety of cattle implants are unfounded; and that products are safe.)

U.S. Meat Export Federation

- Hormones in Meat Production, U.S. Meat Press Information

2. MODULE II: Meat, Nutrition and Your Health

a. Unit 1. Meat Nutrition—Overview

American Dietetic Association

- Low-fat Living—A Guide to Enjoying a Healthy Diet
- Recommendations of Food Choices for Women

American Heart Association

- The American Heart Association Diet—An Eating Plan for Healthy Americans, No. 51-018-B (SA)

- Recipe for Fat—Controlled Low Cholesterol Meals, No. 50-020-B
- Dining Out—A Guide to Restaurant Dining, No. 50-067-A

American Meat Institute

- Fat Facts
- What's in the Meat We Eat?
- Yellow Pages: Answers to Predictable Questions Consumers Ask About Meat

Council for Agricultural Science and Technology

- Briggs, G. 1987. The red meat controversy, *Science of Food and Agriculture*, 5(2)

FDA Consumer

- HHS Publication No. (FDA) 87-2220, "Planning a Diet for a Healthy Heart," 1987

National Live Stock and Meat Board

- Meat Nutri/Scan (on iron and zinc)
- A Change of Plate (chart and food models)
- Eat Light With Beef
- Light Cooking With Beef
- The Lighter Side of Beef
- Meat Nutri-Facts (related to beef, pork and lamb)
- Lean and Light Lamb (recipes)
- Low-Calorie Cooking with Lamb
- The Weekend Athlete: An Exercise and Diet Guide
- Lamb: Today's Nutritive Value
- Beef: A New Look at its Nutritive Value
- Nutritive Value of Meat Food and Nutrition News, Vol. 59:2-4/87

U.S. Department of Agriculture

- Home and Garden Bulletin No. 232, "Dietary Guidelines for Americans"
- Home and Garden Bulletin No. 232-1, "Dietary Guidelines for Americans: Eat a Variety of Foods"
- Home and Garden Bulletin No. 232-2, "Dietary Guidelines for Americans: Maintain Desirable Weight"
- Home and Garden Bulletin No. 232-3, "Dietary Guidelines for Americans: Avoid Too Much Fat, Saturated Fat, and Cholesterol"
- Home and Garden Bulletin No. 232-4, "Dietary Guidelines for Americans: Eat Foods with Adequate Starch and Fiber"
- Home and Garden Bulletin No. 232-5, "Dietary Guidelines for Americans: Avoid Too Much Sugar"
- Home and Garden Bulletin No. 232-6, "Dietary Guidelines for Americans: Avoid Too Much Sodium"
- Home and Garden Bulletin No. 232-7, "Dietary Guidelines for Americans: If You Drink Alcoholic Beverages, Do So in Moderation"
- Home and Garden Bulletin No. 232-8, "Preparing Foods and Planning Menus Using the Dietary Guidelines"
- Home and Garden Bulletin No. 232-10, "Shopping For Food and Making Meals in Minutes Using the Dietary Guidelines"
- Home and Garden Bulletin No. 232-11, "Eat Better When Eating Out Using the Dietary Guidelines"
- Miscellaneous Publication No. 1457, "Dietary Guidelines and Your Diet," Home Economics Teachers' Guide

U.S. Department of Health and Human Services

- DHHS (PHS) Publication 88-50211, "The Surgeon General's Report on Nutrition and Health," 1988

University of Wisconsin

- Meaty Matters: The Nutrient Contribution of Meat to the American Diet (video, 30 minutes)

b. Unit 2. Meat Nutrition—Fats and Cholesterol in the Diet

American Dietetic Association

- Low-Fat Living—A Guide to Enjoying a Healthy Diet
- The Cholesterol Countdown—1,2,3

American Heart Association

- The American Heart Association Diet—An Eating Plan for Healthy Americans, No. 51-018-B (SA)
- Recipe for Fat-Controlled Low Cholesterol Meals, No. 50-020-B
- Dining Out—A Guide to Restaurant Dining, No. 50-067-A
- The Culinary Heart Kitchen Course, 1985

American Meat Institute

- Fat Facts
- What's In the Meat We Eat?

American Pork Producers

- Light. Delicious Dishes Using Pork
- Taste. Delicious Dishes Using Pork

FDA Consumer

- FDA Consumer reprints related to a fats and cholesterol in the diet
- HHS Publication No. (FDA) 87-2220, "Planning a Diet for a Healthy Heart," 1987

Iowa Beef Industry Council

- The Red Meat and Health Program (video, 1/2 inch or 3/4 inch VHS, \$39.95)

National Cattlemen's Association

- The Story of Modern Beef (videotape)

**National Heart, Lung, and Blood Institute of the
National Institutes of Health**

- NHLBI Free Kit '89 (Integrated resource packet to help program planners develop creative health promotion/risk reduction activities for risk factors—smoking, high blood pressure and high blood cholesterol)

National Live Stock and Meat Board

- Exploring Meat and Health
- Meat and Poultry Labels Wrap It Up—With What You Need to Know
- A Change of Plate (chart and food models)
- Eat Light with Beef
- Light Cooking with Beef
- Pork Today—Low Calorie Pork Recipes
- The Lighter Side of Beef
- Meat Nutri-Facts (related to beef, pork and lamb)
- Lean and Light Lamb (recipes)
- Low-Calorie Cooking with Lamb
- Announcing Some New Findings on Cholesterol (brochure)
- Knowledge Best Defense Against Health Fraud, Food and Nutrition News, Vol. 61, 9-10/89.

Texas Beef Council

- A Guide to Heart-Healthy Eating
- On the Trail of Hidden Fat—The Detective Goodheart

U.S. Department of Agriculture

- Home and Garden Bulletin No. 232, "Dietary Guidelines for Americans"
- Miscellaneous Publication No. 1457, "Dietary Guidelines and Your Diet," Home Economics Teacher's Guide
- Fats in Diet, No. 361

U.S. Department of Health and Human Services

- DHHS (PHS) Publication 88-50211, "The Surgeon General's Report on Nutrition and Health," 1988
- NIH Publication No. 88-2928, "Blood Cholesterol Measurement in Clinical Laboratories," 1988
- NIH Publication No. 88-2920, "Eating to Lower Your High Blood Cholesterol," 1987
- NIH Publication No. 87-2922, "So Your Have High Blood Cholesterol," 1987

c. Unit 3. Meat Nutrition—Sodium in the Diet

Alfred Higgins Productions, Inc.

- Salt: The Hidden Threat (motion picture, 16mm, 21 min., color, 1982)

American Dietetic Association

- Your Diet, Salt and Hypertension (motion picture, Journal Films, 1982 (16mm, 13 min.) Audience: Jr. and Sr. High School students)

American Heart Association

- Cooking Without Your Salt Shaker
- National High Blood Pressure Education Program
- National High Blood Pressure 12-Month Kit

FDA Consumer

Reprints from FDA Consumer magazine are:

- How to Ignore Salt and Still Please the Palate (salt-less cooking and eating)
- The Case for Moderating Sodium Consumption (an explanation of sodium-hypertension connection)
- Hypertension Target: Blacks, Elderly (explains why elderly and blacks have greater problems with high blood pressure)

National Health Systems

- Low-Salt Unit (poster)

National Live Stock and Meat Board

- Exploring Meat and Health
- Meat and Poultry Labels Wrap It Up—With What You Need to Know

U.S. Department of Agriculture

- Home and Garden Bulletin No. 237, "Sodium—Think About It"
- Home and Garden Bulletin No. 232, "Dietary Guidelines for Americans"
- Home and Garden Bulletin No. 233, "The Sodium Content of Your Food"
- Reprint from U.S. Department of Agriculture Food in News, "Sodium, Counting Down"
- Miscellaneous Publication No. 1957, "Dietary Guidelines and Your Diet," Home Economics Teacher Guide

U.S. Department of Health and Human Services

- HHS Publication No. (FDA) 84-2179, "A Word About Low-Sodium Diets"
- DHHS (PHS) Publication No. 88-50211, "The Surgeon General's Report on Nutrition and Health," 1985
- NIH Publication No. 84-1459, "Questions About Weight, Salt, and High Blood Pressure," 1984

3. MODULE III: Making Sen\$e of Meat Purchases

a. Unit 1. Meat Cut Identification and Evaluation

NASCO

- Meat Identification Lessons 1–4 (slides with cassette tape, and script) Developed by Extension personnel at Kansas State University and the University of Nebraska

National Association of Meat Purveyors

- Meat Buyer's Guide (oriented toward commercial meat buyers)

National Live Stock and Meat Board

- Materials and Audio-Visual Aids Catalog.
- The Meat Board Guide to Identifying Meat Cuts
- Meat Identification Slides (slide set (NLSMB), 06-601, sets for sale, or borrow from other educational sources, perhaps the county Extension office, school Home Ec or Vo-Ag department)

b. Unit 2. Shopping for Lean Meat

American Meat Institute

- Yellow Pages, Answers to Predictable Questions Consumers Ask About Meat
- What's in the Meat We Eat
- The Economics of Meat

Comprehensive Cookbooks, Meat Sections
(Secured in local bookstores or libraries)

David E. Schafer

- Meat Educational Resources Inventory of various states and trade organizations, DES/KSU-ASI (Meat)/5-89

Food Marketing Institute/NLSMB

- Uniform Product Code (UPC) Identification Numbers for Fresh Red Meat

National Live Stock and Meat Board

- Basics About Beef
- Focus on Pork
- Meat Nutri-Facts (brochure)
- Cut Your Own Beef in-A-Bag
- Meat Evaluation Handbook
- Beef Buyers Guide (slide rule)
- The Art of Selecting Cuts of Pork

U.S. Department of Agriculture

- How to Save Money With Large Cuts of Meat Fact Sheet
- Home and Garden Bulletin No. 238, "Meat and Poultry Labels Wrap It Up"
- Home and Garden Bulletin No. 236, "Meat and Poultry Products—A Consumer Guide to Content and Labeling Requirements"

4. MODULE IV: Preparation of Today's Lean Meat

a. Unit 1. Meat Cookery

b. Unit 2. Proper Handling and Storage

American Lamb Council

- Classic Grilled Lamb
- American Lamb Cookery Basics

Barbecue Industry Association, The

- The Official Guide to Barbecuing

National Live Stock and Meat Board

- Facts About Beef
- Facts About Lamb

- Facts About Pork
- Beef is A Microwave Favorite
- Getting the Most From Freezer Beef Buys
- Cut Your Own Beef in-A-Bag
- Meat Nutri-Facts (brochure)
- What Can You Expect for 300 Calories?
- Beef Is...For One or Two
- Exciting Recipes with Today's Veal
- The Lighter Side of Beef
- Mealstyles
- Eat Light With Beef II
- American Beef Cookouts
- Beef, A New Look at an American Classic
- Pork Today, Low-Calorie Pork Recipes

National Pork Producers Council

- Light and Lean Pork Recipes
- Microwave Cooking Pork
- How to Light a Fire
- New Classics with Pork

U.S. Department of Agriculture

- Home and Garden Bulletin No. 241, "The Safe Food Bank, Your Kitchen Guide"

5. MODULE V: Meat: A Convenience Bill of Fare

a. Unit 1. A New Generation of Convenience Entrees and Dinners

None available.

b. Unit 2. Shopping A La Carte: Take-Out Meats

None available.

c. Unit 3. Eating Out: Your Guide to Good Eating

Dietetic Currents

- Fast Foods 1986: Nutrient Analyses

FDA Consumer

- Dining Out with a Healthy Appetite
- What about Nutrients in Fast Food?

Restaurant Companies (ingredient and nutrition information)

- Arby's, Inc.
- Burger King Corporation
- Jack in the Box

- Kentucky Fried Chicken
- Jerico, Inc.
(Long John Silver's)
- McDonald's Corporation
- Pizza Hut, Inc.
- Wendy's International, Inc.
- Hardee's Consumer Nutrition Department
- Marriott Corporation
(Roy Rogers Restaurants)

D. References

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- U.S. Department of Agriculture—Human Nutrition Information Service. 1983. Composition of Foods: Pork Products. Agricultural Handbook 8-10, U.S. Government Printing Office, Washington, DC.

b. Unit 2. Meat Safety and Wholesomeness

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- Institute of Food Technologies Expert Panel on Food Safety Bacteria Associated with Food-Borne Diseases. Scientific Status Summary by the IFT. 1988. Institute of Food Technologists. 221 North LaSalle Street, Chicago, IL 60611. Vol. 42:4.
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2. MODULE II: Meat, Nutrition and Your Health

a. Unit 1. Meat Nutrition—Overview

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b. Unit 2. Proper Handling and Storage

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E. Publicity Materials

1. MODULE I: The Livestock Industry: Production of Lean, Wholesome Meat for the Consumer

- Radio Spot—Lecture—"The Move Toward Leanness in the Livestock Industry"
- Radio Spot—Seminar—"The Lines of Defense in Keeping Meat Safe"
- News Release—Seminar—"Meat Safety and Wholesomeness Seminar"
- Feature Story—"Meat Industry Declares War on Fat"

2. MODULE II: Meat, Nutrition and Your Health

- Radio Spot—Seminar/Panel Discussion—"Consumer Confusion —The Role of Meat in a Healthy Diet"
- Radio Spot—Public Service Announcement—"Reducing Fat and Cholesterol in the Diet"
- Feature Story—"Nutrient-Dense Meat—What Does it Mean?"
- News Release—Seminar—"Cholesterol and Meat Seminar Scheduled"
- Radio Release—Public Service Announcement—"Reducing Dietary Sodium"

3. MODULE III: Making Sen\$e of Meat Purchases

- Radio Release—Meat Selection Workshop—"Making Sen\$e of Meat Purchases"
- Feature Story—"Extension Service Gives Tips on Selecting Meat Cuts"
- Radio Spot—Public Service Announcement—"Color Guide for Meats"

4. MODULE IV: Preparation of Today's Lean Meat

- Feature Story—"Meat Cookery: The Science Behind the Sizzle"
- Radio Release—"Barbecuing Meats"
- News Release—"Microwaving Meats: Tips for Success"

5. MODULE V: Meat: A Convenience Bill of Fare

- Radio Spot—Workshop—"The New Generation of Meat Convenience Foods"
- Radio Spot—Public Service Announcement—"Safe Use of Carry Out Foods"
- News Release—Grocery Store Tour—"Grocery Store Tours Examine New Meat Convenience Products"
- Feature Story—"Eating Out: Your Guide to Healthy Eating"

MODULE I

The Livestock Industry: Production of Lean, Wholesome Meat for the Consumer

Radio Spot (M1-Lecture)

There is good news for consumers who have been concerned about including beef, pork and lamb in their diets. The livestock and meat industries have done a great deal to produce a much leaner meat product, one that meets health professionals' requirements for a healthy, nutritionally balanced diet.

To learn more about how livestock producers, feeders, packers and retailers have responded to your demands for a lean meat product, come to _____ (location) _____, at _____ (time) _____ on _____ (date) _____ for a one-hour program on **"The Move Toward Leanness in the Livestock Industry."** Learn about the new low fat levels in meat products and how lean meats fit into today's "leaner" diets. This and other timely information is provided by the Extension Service.

Note: If mailing copy to radio station instead of sending tape, include your office address, phone number, contact person and date of release. Also note information "for immediate release."

The radio tape will be enhanced by the addition of background music.

Radio Spot (M1-Seminar)

The 1989 ban on American beef in Europe due to the use of growth hormones has increased consumers' concerns about the safety of the supply of all meats. Many consumers worry not only about the use of the hormone, estrogen, but also about the use of antibiotics in the livestock industry.

_____, Extension _____ Specialist/agent,
Dr. _____ and _____, a meat inspector with
(veterinarian)
the USDA Food Safety and Inspection Service, will discuss "**The Lines of Defense in Keeping Meat Safe,**" during an evening seminar on _____ at _____.
(date and time) (location)
Learn what the experts have to say about the highly regulated meat industry. This and other
informative programs are sponsored by the _____ Extension Service.

Note: If mailing copy to radio station instead of sending tape, include your office address, phone number, the contact person and date of release. Also note information "for immediate release."

Background music may enhance the quality of the radio tape.

News Release (M1-Meat Safety and Wholesomeness Seminar)

Address:

Contact Person:

Date:

Phone Number:

FOR IMMEDIATE RELEASE

Meat Safety and Wholesomeness Seminar

Slated for _____ (date)

_____, (City, State) _____, _____ (Date) _____ - The _____ (County) _____ Extension Service will sponsor a (seminar/lecture/ panel discussion) on (date and time) at _____ (location) _____ on "The Lines of Defense in Keeping Meat Safe." Included will be a discussion by Dr. _____, a locally well-known veterinarian, on the advantages and the risks of using the hormone, estrogen, in meat animals to increase growth rates. Dr. _____ will also review the controversial use of antibiotics in meat animals. _____, a meat inspector with the USDA Food Safety and Inspection Service, will also be on hand to talk about the government's role in regulating the meat industry for safety and wholesomeness.

"The most controversial use of antibiotics in livestock production is the use of certain antibiotics in feeds to increase weight gains over a short period of time," according to Dr. _____.

"The livestock industry has, for the most part, discontinued feeding tetracycline, and does not feed penicillin because it is not approved as a feed additive. Antibiotics are also used when animals are sick. But, animals are not permitted to be marketed until the antibiotic residue has been eliminated from the animal."

"Both the Food and Drug Administration (FDA) and the Environmental Protection Agency (EPA) weigh the risk and benefits of each pharmacological agent before it is approved for either human or animal consumption, and then they monitor the proper use of the drug in the market place. "Our organization," says _____, meat inspector with the USDA Food Safety and

More

Meat Safety and Wholesomeness - Add One

Inspection Service (FSIS), "is responsible for ensuring that the American food supply is safe and wholesome. We examine cattle, hogs and sheep and their carcasses for healthfulness before, during and after the slaughter process."

The safety of the U.S. meat supply will be discussed in depth during the _____
Extension Service sponsored program. All persons interested in this topic are urged to attend. For
more information call the _____ County Extension Office at _____ phone # _____.

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Feature Story (M1-Move Towards Leanness)

Address:

Contact Person:

Date:

Phone Number:

Meat Industry Declares War On Fat

From livestock producers to feeders to packers to retailers, the meat industry has declared war on fat in beef, pork and lamb products. Because consumers are demanding leaner meat, virtually all phases of the food chain have responded by producing and marketing meat products tailored to consumer preferences.

This trend is most obvious in the meat counters of grocery stores. In 1986, the average beef cut had 1/2 inch of external, trimmable fat. By 1988, the average cut had only 1/8 inch of trimmable fat. Pork and lamb cuts have also followed a similar trend. In fact, a "fat war" has developed between retailers to such an extent that many retailers are providing totally trimmed cuts at the meat counter. A recent national study showed that fat on retail meat cuts is not only trimmed at the grocery store, but also at home. Eighty-one percent of consumers trim some fat from meat cuts and 65 percent trim nearly all of the fat.

As beef, pork and lamb cuts are trimmed closer, the nutritive value increases proportionately. The United States Department of Agriculture has recently published the newly revised nutritional composition of meat cuts to provide consumers with nutritional information on a "lean only" basis as well as a "lean and fat" basis for beef and pork. The new information will also be available for lamb in the very near future. As a result of this new nutrition information reflecting the leanness of beef, pork and lamb, the American Heart Association now recognizes lean meat as a viable and healthful source of protein and other important nutrients to the American diet.

Not only is the retailer responding to consumer demands for lean meat, but animals are being marketed before they can become overly fat. Thus, the amount of "intramuscular" fat, or fat within

More

Meat Industry Declares War On Fat - Add One

the muscle, is reduced. This is important because it is the type of fat that you cannot trim away. And more fat is being trimmed from the animals at the packing plants before it is sent to the retailer. To provide the kind of animal demanded by the packers and retailers, many ranchers and farmers are producing animals with superior trimmness and muscling. Livestock producers are closely examining the genetics of their herds and flocks, trying to identify those individuals that will produce offspring with a minimum amount of fat and a maximum amount of taste appeal.

For more information on the nutritive value of meats or on producing lean beef, pork or lamb, contact the _____ County Extension office, _____ (phone number) _____.

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MODULE II

Meat, Nutrition and Your Health

Radio Spot (M2-Seminar/Panel Discussion) or Adapt for News Release

If you are like many Americans, you may be confused about whether or not you should eat meat. Current nutrition and medical research indicates you can eat meat and that it is a food packed with essential nutrients. Many of the meat cuts fit well within the American Heart Association's nutritional guidelines. But, how much should you eat, how often should you eat meat and what cuts of meat are the lowest in total fat, saturated fatty acids and cholesterol?

The _____ Chapter of the American Heart Association and the _____ County Extension Service are sponsoring an evening seminar entitled, "**Consumer Confusion-The Role of Meat in a Healthy Diet.**" The seminar will be held on _____ (date and time) at _____ (location) _____. Featured speakers include: _____

(i.e., nutritionist, American Heart Association representative, local physician, meat scientist). For more information, contact the _____ County Extension Office _____ (phone) _____ or the American Heart Association _____ (phone) _____.

Note: If mailing copy to the radio station instead of sending tape, include the current date, your office address, phone number, contact person and indicate "for immediate release."

If using a radio tape, background music may enhance quality of tape.

**Radio Spot (M2—Public Service Announcement—Reducing Fat and Cholesterol in Diet)
or adapt for News Release or Newsletter article or column.**

“Avoiding too much total fat, saturated fatty acids and cholesterol in your diet” does not mean “never eat lean meat” because it contains fat, or “never eat egg yolks” because they contain cholesterol. What is important is the total amount of fat, saturated fatty acids and cholesterol in your diet. While you may want to reduce your intake of some foods, you don’t have to eliminate them from your diet completely. Instead, balance high-fat foods with other foods that contain less fat and cholesterol.

Here are a few helpful hints:

- Remove fat from meats and remove skin from poultry before preparing.
- Broil, roast or bake meats rather than frying. Skim fat from stews and soups.
- Substitute plain low-fat yogurt for sour cream or mayonnaise in dips and dressings.
- Substitute skim milk for whole milk in baking and sauces.
- Substitute 2 egg whites for 1 whole egg in baking.

For more information on reducing fat and cholesterol, as well as information on other timely nutrition topics, contact the _____ County Extension Office.

Note: Include your name, address and phone number with the radio tape or release.

Feature Story (M2-Nutrient-Dense Meats)

Date:

Contact person:

Location:

Phone Number:

FOR IMMEDIATE RELEASE

Nutrient-Dense Meat—What Does it Mean?

Concern about the role of diet as it relates to health continues to increase among both health professionals and consumers. Studies have shown that there may be a link between the fat we eat and our risk of heart disease and cancer. Targeted in these studies is the role of saturated fatty acids in the development of coronary heart disease. Several foods have been in question, including meats.

During the past several years, ranchers and farmers have responded to consumers' demands for leaner meat products by raising animals that produce less fat and more lean. Today, most retail cuts have less marbling and are trimmed of most external fat. Based on new data on today's meat animals, most health professionals agree that lean cuts of meat, eaten in the proper amounts, have a place in a balanced diet made up of a variety of wholesome, nutrient-dense foods.

Meats are nutrient-dense because they provide a high proportion of nutrients to calories. The nutrients found in meat include protein, iron, zinc, thiamin, Vitamin B₂ and Vitamin B₁₂.

According to the Dietary Guidelines for Americans, the average 23- to 50-year-old woman consumes 2,000 calories per day and the average man about 2,700 calories. The American Heart Association recommends no more than 30 percent of the calories come from fat and that less than one-third of these fat calories should come from saturated fatty acids. The Dietary Guidelines recommend two servings from the meat group per day—each serving is 2 to 3 ounces of cooked meat.

A 3-ounce serving of cooked lean beef with the fat trimmed provides only 78 calories from fat with 30 of these coming from saturated fatty acids. The same amount of cooked lean pork provides 100 calories from fat, with 34 from saturated fatty acids. Cooked trimmed lamb contains only 73 calories of total fat with 24 in saturated fatty acids.

More

Nutrient-Dense Meats – Add One

One 3-ounce serving each of beef, pork and lamb contributes less than 10 percent of a 2,000 calorie diet while providing much higher proportions of other nutrients. Therefore, today's leaner meat is an excellent nutrition buy. You get more nutrition for a lower "cost" in calories from fat and calories from saturated fatty acids. In addition to its nutrient density, 96 percent of meat is digested with the nutrients being almost completely absorbed by the body.

#

Date:

Contact Person:

Location:

Phone Number:

FOR IMMEDIATE RELEASE

Cholesterol and Meat Seminar Scheduled

_____, _____ (City, State), _____ (Date) —Can meat be included in a low-cholesterol diet? "Yes, says Dr. _____ with the _____ Extension Service. "To control cholesterol and saturated fatty acids in the diet, you may include several cuts of meats in your diet. The key is to control serving size, select lean meats and prepare lean meats without adding extra fat."

Dr. _____ and several other nutrition authorities including _____ will address the topic of cholesterol and meats at a seminar sponsored by the _____ and the _____ on _____ (date and time) at _____ (location). Reservations for the seminar may be made by calling _____.

According to Dr. _____, "Coronary heart disease is the leading cause of deaths in the United States. More than 1.25 million heart attacks occur yearly, two-thirds of which are in men, and as a result, over 500,000 people die. Most coronary heart disease results from atherosclerosis, a progressive disease in which fatty materials, mainly cholesterol, fat and debris, are deposited by the blood along the walls of the arteries, thus restricting normal blood flow and ultimately leading to a heart attack or stroke. Smoking and high blood pressure along with high blood cholesterol are the most clearly established risk factors for heart disease."

"Persons with high cholesterol levels develop atherosclerosis more often than those with normal levels," reports _____ from the American Heart Association. "Persons with atherosclerosis usually have higher blood cholesterol levels than persons without atherosclerosis.

If you have been instructed to reduce dietary cholesterol, you need to be able to recognize the type of fats in foods, hidden and visible."

More

Cholesterol and Meat Seminar – Add One

The American Heart Association and the National Cholesterol Education Program recommend limiting cholesterol intake to 300mg or less per day. A 3-ounce serving of lean meat contains about 70mg of cholesterol, and with low-fat preparation techniques, can be a part of a low-cholesterol diet.

To learn more about controlling cholesterol in the diet, particularly in the use of meats, make plans to attend the seminar on _____ (date) _____.

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Radio Release (M2-Public Service Announcement—Reducing Dietary Sodium)

For some people, too much sodium may increase their chance of developing high blood pressure. Having high blood pressure increases the risk of heart attacks, strokes and kidney disease. Salt, which is 40 percent sodium, is used widely in the preservation, processing and preparation of foods. One teaspoon contains 2g of sodium.

Here are a few tips to help reduce sodium in your diet:

- When you shop, look for sodium on the food label of processed meats. Labels can help you make wise selections to reduce sodium consumption.
- Use less salt at the table and in cooking.
- Substitute alternative flavoring for salt, such as spices, herbs and lemon juice.
- Baste lean meats with wine, seasoned vinegar or lemon juice instead of adding soy or teriyaki sauces or cooking wines.

For more information on this and other nutrition topics, contact the _____ County Extension Office.

Note: Include your name, organization, address and phone number with all tapes and written releases.

MODULE III

Making Sen\$e of Meat Purchases

Radio Release (M3-Meat Selection Workshop)

Do you ever find yourself standing in front of the meat counter wondering which meats are tough or tender, or which ones are lower in fat and calories than others? Do you know how to determine value for your meat food dollar?

You can answer these questions, plus many others, by attending the workshop on Meat Selection, sponsored by the _____ Extension Service and Supermarkets on _____ (date _____ and time) _____ at _____ (location) _____. For more information contact the County Extension Office by calling _____.

Note: Include your name, organization, address and phone number with the copy of the tape or with the release and indicate "for immediate release."

Feature Story (M3-Making Sense Out of Meat Purchases)

Address :

Contact Person:

Date:

Phone Number:

Extension Service Gives Tips on Selecting Lean Meat Cuts

Mouthwatering visions of lower calorie dishes like Cajun Blackened Steak, Jalapeno Grilled Pork Chops or Oriental Lamb Kabobs rush through your mind as you plan tonight's dinner. But when you get to the meat counter, you are in a quandry as to the right cut of meat to buy for the recipe. And, which of the appropriate cuts are the leanest? Sound familiar? If so, these guidelines may be just what you need to help you make lean meat purchases.

- Select cuts from the loin or round (leg) areas of the carcass. These cuts get more exercise and thus produce less fat and are usually leaner than cuts from the chuck (shoulder) or rib sections of the carcass. Most of the cuts from these two sections of the carcass contain the words "loin," "round" or "leg" in some portion of the name of the cut.
- Select cuts with a minimum amount of seam fat, or visible fat between the smaller muscles in the meat. And trim as much fat as possible, both outside and between the muscles, before cooking.
- Select cuts with a minimum amount of marbling (the flecks of fat found within the muscle). At most, the marbling should appear like lightly sprinkled salt in the meat. A "slight" to "small" degree of marbling does self baste the meat as it is cooking, so it isn't necessary to add fats or oils for flavor or juiciness. Meat graded "Select" has less marbling than meat graded "Choice."

Lean meat, very well trimmed, yet containing a "small" amount of marbling, will contain about 120 calories from fat per 3-ounce cooked serving. To avoid adding more calories during cooking, use herbs and spices for seasoning rather than butter, margarine, heavy sauces or gravies. Also limit the use of added flour, sugar or fat.

To obtain more information on selecting lean cuts of meat, contact the _____ County Extension office by calling _____.

Radio Spot (M3-Public Service Announcement-Color Guide for Meats)
May be adapted for Newspaper Release or News Column

Can you look at a piece of fresh meat and tell from its color whether it is beef, pork or lamb? Can you tell if it is developing an "off" color and should either be used immediately, or perhaps even discarded? These few basic tips on meat color should help you improve your meat color identification skills:

First of all, the color of the different species of fresh meat varies under normal lighting and freshness conditions. Beef is cherry red. Pork is light grayish to pink. Lamb is pinkish to red. And veal is white to light grayish or pink in color.

Secondly, the freshness of meat can be determined to a large degree by color changes. For example, the freshest cut of beef will be a purplish-red. As more oxygen permeates the meat, it becomes bright red. But, as it begins to deteriorate, it takes on a brownish color. At this point, the meat should be used immediately and should be well cooked. If the meat is gray-green in color with a yeasty aroma, it has begun to spoil. As spoilage continues, the surface will become slimy, the meat will develop a putrid odor and will be totally brown in color. Never eat meat that is spoiled.

Thirdly, most fresh meats are packaged in "oxygen permeable" packaging which allows the bright red color to develop in meat. However, a relatively new type of packaging of meats known as "vacuum-packaging" is being used in some cases that does not allow oxygen to permeate the package, so the meat stays in the purplish-red state of color. This type of packaging increases the shelf-life of meats. After the vacuum package has been opened and the meat has been exposed to air for about 15 minutes, it becomes bright, cherry red and then goes through the normal color changes.

Remember to use both your eyes and your nose in determining the freshness of meats or any other perishable food product. For more information on meat selection, food safety or other related topic, contact the _____ County Extension Office at _____ (phone number) _____.

Note: Include your name, the name of your organization, your address and phone number with the radio tape or the written PSA.

MODULE IV

Preparation of Today's Lean Meat

Feature Story (M4-The Science Behind the Sizzle)

Date:

Contact Person:

Address:

Phone Number:

Meat Cookery: The Science Behind the Sizzle

Whether you are a gourmet chef, or just put on your apron and hat for an occasional outdoor barbecue, you have most likely been in charge of the meat for a meal at one time or another. That means taking the credit, or the blame, for the way the meat turns out. Understanding what happens to meat during cooking could be a real asset to you during your next culinary adventure.

Cooking meat enhances its appearance and flavor, helps improve its tenderness and destroys any potential bacteria and parasites that could cause human illness. When meat is cooked, the meat proteins begin to break down, or denature. With cooking, the muscle proteins begin to become more rigid and tougher. At 147° F (medium rare), the proteins begin to harden. And, as the internal temperature increases over 147° F, tenderness may decline. So, the longer meat is cooked above medium rare, the tougher it can become.

During cooking, the water holding capacity of the proteins decreases and water is lost from the meat. Enzyme activity within the meat increases during cooking, which helps to increase tenderness in the meat. As the meat cooks, the flavor and aroma are enhanced.

Cooking also affects the collagen proteins. Between 125° and 140° F, the collagen begins to shrink and toughen. With the presence of moisture, however, the collagen forms a gelatin, therefore helping to tenderize the meat. That is why cooking in liquid is a tenderizing method.

The cooking rate also affects the final meat product. The faster and hotter the cooking method, the greater the loss of moisture and fat in the meat, and possibly the greater the toughness.

More

Meat Cookery: The Science Behind the Sizzle – Add One

So, what does all of this mean? The most important thing for you to know is the type of cut you are buying, whether or not it is considered to be a “more” or “less” tender cut of meat, how it should be cooked and at what temperature.

The “more” tender cuts of meat should be roasted in a slow oven at 300° to 325° F. They include: beef rib roast and sirloin tip roast, leg of lamb, pork Boston butt, fresh ham or cured ham. Some “more” tender cuts of meat may be broiled at 400° F, including: beef T-bone, porterhouse, ribeye and strip loin steaks; pork rib and loin chops; and lamb loin and rib chops.

Cuts that may be panbroiled include: beef sirloin, ribeye, T-bone and porterhouse steaks or ground patties; pork blade, loin and rib chops; and lamb rib, loin chops or ground patties. For pan-frying or stir-frying, use beef top round or sirloin steaks, pork rib chops or lamb loin chops.

Now, for the “less” tender cuts, use “moist heat” methods (cook in a liquid). To braise meat, cook it tightly covered in a small amount of liquid. Use the beef arm roast or 7-bone roast, pork country-style ribs or lamb shoulder chops. Or, for stewing, use beef stew meat or boneless brisket, pork picnic roasts or lamb shoulder meat or stew.

For best results in cooking any type of cut, cook at a low temperature without overcooking the meat. For more information on meat cookery, contact the _____ County Extension Office by calling _____.

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**Radio Release (M4-Barbecuing Meats) or adapted for newsletter
or Newspaper Release late spring or summer for most locations**

It's that time of year again. Yes, the barbecue season has finally arrived. No matter what kind of barbecue grill you own, or what type of meat is to be cooked, there are some guidelines to follow to ensure perfect outdoor cooking:

- Make sure the grill is in a well-ventilated area.
- Cook all meat cuts, especially lean cuts, at low temperatures using indirect heat.
- Watch meat carefully while grilling.
- Use a meat thermometer to accurately determine when done.
- Use a marinade to add flavor and/or tenderize the meat.

For more information on barbecuing meats, contact the _____ County Extension Office.

Note: Include your name, organization, address and phone number with the tape or with the written release. Also indicate when this tape would most appropriately be aired.

News Release (M4—Cooking Meats in the Microwave)

Date:

Contact Person:

Address:

Phone Number:

FOR IMMEDIATE RELEASE

Microwaving Meats: Tips for Success

Have you ever tried cooking a cut of meat in the microwave oven and had it come out gray in color, tough and rubbery? Just follow a few simple rules for microwave cookery and your next venture should be a successful one.

As a general rule, most cuts should be microwaved at a low power setting, such as medium or medium low. Ground meat or reheated products may be cooked on high power.

Here are some other helpful hints:

- Roasts should not exceed 2 pounds for best results.
- Shape 1 pound of ground meat into four 1/2-inch thick patties. Form a 3/4-inch hole in the center of each and top with seasoning mix for evenly cooked, well browned burgers.
- Arrange patties or meatballs in a circle, leaving a hole in the center of the formation.
- Small portions cook faster than large portions and thin portions cook faster than thick portions.
- Cover meat with waxed paper or plastic wrap to prevent it from drying out.

For more information on meat cookery, contact the _____ County Extension Office.

MODULE V

Meat: A Convenience Bill of Fare

Radio Spot (M5-Workshop—"The New Generation of Meat Convenience Foods")

American lifestyles have changed dramatically within the last decade. One of the biggest changes has been in the types of foods we eat, when and where we eat them and how they are prepared. As we eat more time-saving convenience foods, we should be sure that these foods are meeting our nutritional needs and that we are handling and storing them safely once the foods leave the marketplace.

Make your reservation now for the _____ (date) _____ workshop on selecting and handling "The New Generation of Convenience Foods," sponsored by the _____ County Extension Service. Nutritional evaluation and safety of frozen entrees will be discussed and participants will have a first hand look at many of the new types of refrigerated foods. For more information on time and location, call _____.

Note: If mailing copy to radio station instead of sending tape, include your office address, telephone number, contact person and date on the release. Also note the spot "for immediate release."

The addition of background music may enhance the quality of the tape.

Radio Spot (M5-Informational-Safe Use of Carry Out Foods)

If you are one of the millions of Americans who stop by the local deli department of the supermarket or swing by a favorite restaurant to pick up the evening meal, the safety of the food may not occur to you, but it should. To avoid food-borne illness from carry out foods, follow a few simple rules:

Make the deli-section of the supermarket your "last stop" in your grocery shopping before checking out. This will keep to a minimum the amount of time the carry out item is at room temperature.

Avoid making other time-consuming stops on your way home after picking up pre-prepared items. Once you arrive home, either refrigerate or serve the food immediately.

Keep hot foods hot (above 140° F) and cold foods cold (below 40° F). Do not leave them at room temperature for more than two hours. Over half of food-borne illness is caused at home. Be sure it is not your home.

For more information on the safety of convenience foods, contact the County Extension Office by calling _____.

Note: If mailing copy to radio station instead of sending tape, include your office address, telephone number, contact person and date on the release.

News Release (M5-Grocery Store Tour-Convenience Meat Products)

Date:

Contact Person:

Address:

Phone Number:

FOR IMMEDIATE RELEASE

**Grocery Store Tours Examine
New Meat Convenience Products**

Shoppers See New Convenience Meats

_____ (City, State) (Date) _____ — Convenience meat products, including frozen entrees, prepared dinners, ready-to-eat processed meats and deli meats, offer many advantages to the busy consumer. The _____ County Extension Service will sponsor a series of grocery store tours in cooperation with _____ (name[s] of cooperating supermarkets) _____ to closely examine the new convenience meat products on the market and assist consumers in developing skills to compare costs and nutrient content of these items.

According to _____, County Extension Agent, "Consumers may sign up for one or more of the tours, which are being scheduled during the week of _____, 19____. We are trying to set up the times so that people who work outside the home may also attend."

"The use of convenience meat products by busy professionals is greatly increasing," says _____, "because these entrees offer such advantages as reduced preparation time, elimination of many preparation steps, increased variety, portion control, reduced leftovers and decreased waste."

Product information such as nutrition labels, ingredient listing and price per serving will be discussed to help consumers make informed choices regarding the use of convenience meat products. Participants will compare costs and nutrient content to determine how much of their food budget should be spent on these products.

For more information on the grocery store tours, contact the _____ County Extension office by calling _____.

Feature Story (M5-Eating Out-Your Guide to Good Eating)

Date:

Contact Person:

Address:

Phone Number:

Eating Out: Your Guide to Healthy Eating

"Eating out" is no longer reserved for special occasions. It is now a way of life for most Americans. Today, Americans eat more than one third of their meals and snacks away from home and spend nearly half of every food dollar at restaurants. The National Restaurant Association estimates that more than 45 billion meals are eaten out annually and that the average person eats out approximately 192 times a year.

Due to consumer demand, more restaurants are changing their menus to satisfy their calorie-counting, nutrition-conscious clientele. Fast food menus offer more choices today, including lighter, leaner selections for those who cannot afford extra calories and fat. At most fast food restaurants you will find smaller burgers and entrees for light appetites as well as a choice of preparation methods— broiling, baking and grilling meats—instead of frying, which can multiply calories and increase fat content.

The following are some general nutrition tips concerning several of the popular fast food items:

- A "hamburger" is a good source of protein, iron, zinc and several of the B-vitamins. Even a small burger provides about one third of your daily protein needs. Add a bun made from enriched or whole wheat flour and increase vitamins, minerals, dietary fiber and complex carbohydrates. The size of the burger affects the calorie level. Regular burgers average less than 300 calories, medium-size are 400 to 500 calories and large burgers are 500 to 1,000 calories. Cheese adds some vitamin A and calcium, plus 50 to 100 calories.
- A plain roast beef sandwich with no sauce contains as much as 250 fewer calories than a large hamburger, with as much protein and iron, but only a fraction of the fat. Add tomatoes and lettuce for vitamin C and dietary fiber.

More

Eating Out—Your Guide to Good Eating – Add One

- A ham and cheese sandwich is a good source of high quality protein and calcium. Calorie content ranges between 400 and 500.
- Mexican food can be nutritious as well as moderate in calories, if you make wise selections. Corn tortillas (not fried) are a source of fiber and calcium, while chili and tomatoes give you vitamins A and C. Beef and beans provide protein, B-vitamins, iron and other minerals. Most tacos and tostadas have 200 to 300 calories while enchiladas and burritos range from 350 to 450 calories.
- Fish and chicken are good sources of protein, B-vitamins and some minerals. However, the coating and deep-frying at fast-food restaurants greatly increases the fat and calorie content as does the addition of tartar sauce.

Many full-service restaurants are offering lighter dishes emphasizing freshness, quality, regional cooking and seasonal foods. Compared to fast food places, they enjoy greater flexibility to adapt menus and preparation methods quickly to meet changing consumer preferences.

To respond to the demand for lean meat and food prepared without sauces, butter and salt, some restaurants will alter the way they prepare food at the diner's request. Almost all restaurants will serve sauces and salad dressings on the side or cook without salt. Most restaurants are now broiling, roasting, grilling and baking a large portion of their entrees instead of frying. Many even promote nutritious or low-calorie fare. And, many restaurants poach meats using fat-free liquids such as vegetable juice and wine, or stir-fry.

If you have questions about menu descriptions or preparation techniques, be sure to ask when ordering. Don't be shy about asking the waiter to have food prepared the way you like it.

Regardless of whether you grab a fast-food meal or sit down to a full course dinner, there is no doubt that your choices for nutritious food are getting better.



Would you like to know more about...

- Selecting **LEAN MEATS** in the supermarket?
- Preparing **LEAN MEATS** at home?
- Nutritional information on **LEAN MEATS**?
- New "convenience" meat products in the marketplace?
- Safeguards for the production and distribution of safe, wholesome meats?

Choose one of two easy ways to find out more about **LEAN MEAT**...

1. Attend seminars, short courses or programs in your area, or
2. Sponsor a program on **LEAN MEAT** for your organization or group.

Mail

Fill out this form and mail it to:

(Extension Agent Name)
(_____ County Extension Service)
(Street Address/P.O. Box)
(City, State, Zip)

Phone

Or Call:

(County Extension Office phone number)

-
- ☐ **YES** Please send me information on **LEAN MEAT** programs scheduled in my area.
- ☐ **YES** Please contact me to schedule a **LEAN MEAT** program for my organization or group.

Name _____

Organization _____

Address _____

City, State, Zip _____



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